d) This is an incident and the pilot-in-command must report it to the airport authority within the next 48 hours.

10.13.1.0 (512)
Who is responsible, under Annex 13 of the Chicago convention for the initation of an accident investigation?
a) The government of the state in which the accident took place
b) Operators of the same aircraft type
c) The aircraft manufacturer
d) The law enforcement authorities of the state in which the aircraft is registered

10.13.1.0 (513)
Upon receipt of the modification and a request by the state of occurrence for participation, the state of design and the state of manufacture shall in the case of an accident or serious incident inform the state of occurence of the name of its representative to be present at the investigation when the aircraft :
a) Has a maximum mass over 100.000 kg
b) Has a maximum mass over 27.000 kg
c) Has a maximum mass over 5 700 kg
d) Has a maximum mass over 2 250 kg

21.1.0.0 (514)
For FAIL-SAFE designed structural parts :1 The mounting principle is parallel mounting.2 No routine check is necessary.3 The member is removed at the end of the calculated life cycle.4 Certain components may not be accessible.5 The principle is the redundancy of components6 The failure of a member causes the loads to be shared between the other system components.The combination regrouping all the correct statements is :
a) 1,5,6
b) 2,3,4
c) 1,3,4
d) 2,5,6

21.1.1.0 (515)
DURALUMIN alloys :1 have an aluminium-copper base.2 have an aluminium-magnesium base.3 are easy to weld.4 are difficult to weld.5 have a good thermal conductivity.6 have a poor air corrosion resistanceThe combination regrouping all the correct statements is :
a) 1,4,5
b) 2,4,5
c) 1,3,6
d) 2,3,6

21.1.1.0 (516)
Among the different types of aircraft structures, the shell structures efficiently transmit the:1. normal bending stresses2. tangent bending stresses3. torsional moment4. shear stressesThe combination regrouping all the correct statements is :
a) 1, 2, 3
b) 2, 3, 4
c) 1, 2, 4
d) 1, 3, 4

21.1.1.0 (517)
'Fail safe construction' is :
a) A type of construction in which the load is carried by other components if a part of the structure fails.
b) A simple and cheap type of construction.
c) A type of construction for small aircraft only.
d) A construction which is suitable for aerobatic flight.

21.1.1.0 (518)
The fuselage of an aircraft consists, among others, of stringers whose purpose is to:
a) assist the skin in absorbing the longitudinal traction-compression stresses.
b) withstand the shear stresses.
c) provide sound and thermal isolation.
d) integrate the strains due to pressurization to which the skin is subjected and convert them into a tensile stress.

21.1.1.0 (519)
The reason for the fact that an aeroplane designed for long distances cannot simply be used for short haul flights at higher frequencies is that
a) the lifetime of the fatigue sensitive parts has been based on a determined load spectrum
b) the procedures and checklists for this kind of aeroplanes will take too much time
c) these aeroplanes often consume too much fuel on short haul flights.
d) in that case some fuel tanks remain empty during the whole flight, which stresses the aeroplane's structure in an unacceptable way

21.1.3.0 (520)
The wing of an aircraft in flight, powered by engines located under the wing, is subjected to a bending moment which causes its leading edge, from the wing root to the wing tip, to operate in:
a) compression, then in tension.
b) tension, then in compression.
c) tension.
d) compression.

21.1.3.0 (521)
In flight the wing of an aircraft containing fuel is subjected to vertical loads that produce a bending moment which is:
a) highest at the wing root
b) equal to the zero -fuel weight multiplied by the span
c) equal to half the weight of the aircraft multiplied by the semi span
d) lowest at the wing root

21.1.3.0 (522)
The Maximum Zero Fuel Mass:1 Is a limitation set by regulation.2 Is designed for a maximum load factor.3 Is due to the maximum bending moment at wing root.4 Requires to empty external tanks first.5 Requires to empty internal tanks first.The correct combination of true statements is :
a) 1,2,3
b) 2,5

c) 2,4
d) 1,3,5

21.1.3.0 (523)
On a non-stressed skin type wing, the wing structure elements which take up the vertical bending moments Mx are:
a) the spars.
b) the ribs.
c) the webs.
d) the skin.

21.1.4.0 (524)
The advantage of mounting the tailplane on top of the vertical stabilizer is :
a) to withdraw it from the influence of wing turbulence
b) to a have greater effectiveness at high speed
c) that it does not require a de-icing system
d) to decrease fuel consumption by creating a tail heavy situation

21.1.5.0 (525)
A torsion link assembly is installed on the landing gear to :
a) avoid rotation of the piston rod relative to the gear oleo strut.
b) absorb the spring tension.
c) control the wheels.
d) lock the landing gear.

21.1.5.0 (526)
In a commercial transport aircraft the landing gear operating system is usually:
a) Hydraulically driven.
b) Mechanically driven.
c) Pneumatically driven.
d) Electrically driven.

21.1.5.0 (527)
Generally, on modern jet transport aircraft, how can the landing gear be extended if there is a complete hydraulic system failure.
a) Mechanically
b) Electrically.
c) Pneumatically.
d) By hydraulic accumulators.

21.1.5.0 (528)
If the profile grooves or the tread of a new aircraft tyre are worn, the tyre can be:
a) Repaired several times.
b) repaired once.
c) Never repaired.
d) Used on the nose wheel only.

21.1.5.0 (529)
The operating principle of an anti skid system is as follows : the brake pressure will be :
a) Decreased on the slower turning wheels.
b) Increased on the faster turning wheels.
c) Decreased on the faster turning wheels.
d) Increased on the slower turning wheels.

21.1.5.0 (530)
The type of brake unit found on most transport aeroplanes is a:
a) Multiple disk brake.
b) Drum type brake.
c) Single disk brake.
d) Belt brake.

21.1.5.0 (531)
The reason for fitting thermal plugs to aircraft wheels is that they :
a) release air from the tyre in case of overheating.
b) prevent the brakes from overheating.
c) prevent heat transfer from the brake disks to the tyres.
d) release air from the tyre in case of overpressure.

21.1.5.0 (532)
Thermal plugs are installed in:
a) wheel rims.
b) fire warning systems.
c) cabin windows.
d) cargo compartments.

21.1.5.0 (533)
When a landing gear wheel is hydroplaning, its friction factor is equal to:
a) 0
b) 1
c) 0.1
d) 0.5

21.1.5.0 (534)
Shimmy occurs on the nosewheel landing gear during taxiing when:1. the wheels tend to describe a sinusoidal motion on the ground2. the wheels no longer respond to the pilot's actionsThis effect is overcome by means of:3. the torque link4. an accumulator associated with the steering cylinderThe combination of correct statements is:
a) 1, 3.
b) 1, 4.
c) 2, 4.
d) 2, 3.

21.1.5.0 (535)
The illumination of the green landing gear light indicates that the landing gear is :
a) locked-down.
b) in the required position.
c) locked-down and its door is locked.
d) not in the required position.

21.1.5.0 (536)
A tubeless tyre has :1- a built-in-air tube.2- no built-in-air tube.3- a crossed side casing.4- a radial side casing.The combination of correct statements is:
a) 2, 4.
b) 1, 4.
c) 2, 3.
d) 1,3.

21.1.5.0 (537)
In a hydraulic braking system, the accumulator is:
a) an accumulator designed to restore brake energy in the event of a hydraulic failure.
b) a damping type accumulator designed to take up the pressure fluctuations of the automatic braking system.
c) designed to take up the hydraulic energy filtered by the anti-skid system in order to prevent wheel blocking.
d) a buffer accumulator whose function is to assist the hydraulic system during high intensity braking.

21.1.5.0 (538)
Which is (are) the damping element(s) in a landing gear shock absorber used on larger aircraft ?
a) Nitrogen and a viscous liquid.
b) Nitrogen.
c) Oxygen.
d) Springs.

21.1.5.0 (539)
In some aircraft, there is a protection device to avoid the landing gear being inadvertently retracted on the ground. It consists of :
a) A latch located in the landing gear lever.
b) An aural warning horn.
c) A warning light which is activated by the WOW (Weight On Wheels) sensor system.
d) A bolt.

21.1.5.0 (540)
A tubeless tyre is a tyre:1. which requires solid or branched wheels2. whose valve can be sheared in sudden accelerations3. whose mounting rim must be flawless4. which requires no rim protection between rim flange and tire removing device5. which does not burst in the event of a tire puncture6. which eliminates internal friction between the tube and the tireThe combination regrouping all the correct statements is :
a) 1, 5, 6.
b) 3, 4, 5.
c) 1, 2, 5.
d) 2, 3, 6.

21.1.5.0 (541)
Landing gear torque links are used to:
a) prevent rotation of the landing gear piston in the oleo strut.
b) take up the lateral stresses to which the gear is subjected.
c) prevent the extension of the landing gear oleo strut rod.
d) maintain the compass heading throughout taxiing and take-off.

21.1.5.0 (542)
A main landing gear is said to be ""locked down"" when:
a) the strut is locked by an overcentre mechanism.
b) it is in the down position.
c) the actuating cylinder is at the end of it's travel.
d) the corresponding indicator lamp is amber.

21.1.5.0 (543)
The modern anti-skid processes are based on the use of a computer whose input data is:1. idle wheel speed (measured)2. braked wheel speed (measured)3. brake temperature (measured)4. desired idle wheel train slipping rate5. tire pressureThe combination regrouping all the correct statements is :
a) 1, 2, 4.
b) 1, 2, 3, 4, 5.
c) 2, 4.
d) 1, 3.

21.1.5.0 (544)
On large aeroplanes equipped with power brakes, the main source of power is derived from :
a) the aeroplane's hydraulic system.
b) the master cylinders.
c) pressure to the rudder pedals.
d) the brake actuators.

21.1.5.0 (545)
""Nose wheel shimmy"" may be described as :
a) a possibly damaging vibration of the nose wheel when moving on the ground.
b) the oscillatory movement of the nose wheel when extended prior to landing.
c) the amount of free movement of the nose wheel before steering takes effect.
d) aircraft vibration caused by the nose wheel upon extension of the gear.

21.1.5.0 (546)
The part of the flight that will cause the highest loads on the torsion link in a bogie gear is
a) Taxiing with a small turning radius.
b) Touch down with crosswind
c) Gear down selection
d) Braking with an inoperative anti skid system.

21.1.5.0 (547)
Tyre ""creep"" may be described as the :
a) circumferential movement of the tyre in relation to the wheel flange.
b) the increase in inflation pressure due to drease in ambient temperature.
c) the decrease in inflation pressure due to increase in ambient temperature.
d) gradual circumferential increase of tyre wear.

21.1.5.0 (548)
The ABS (Auto Brake System) is being diconnected after landing ..
a) by pilot action
b) automatically
c) at a certain low speed
d) the system is always armed

21.1.5.0 (549)
The purposes of the oil and the nitrogen in an oleo-pneumatic strut are :
a) the oil supplies the damping function and the nitrogen supplies the spring function
b) the oil supplies the spring function and the nitrogen supplies the damping function.
c) the oil supplies the sealing and lubrication function, the nitrogen supplies the damping function.
d) the oil supplies the damping and lubrication function, the nitrogen supplies the heat-dissipation function.

21.1.5.0 (550)
The function of a fusible plug is to
a) protect the tyre against explosion due to excessive temperature.
b) protect the brake against brake disk fusion due to excessive temperature.
c) function as a special circuit breaker in the electric system
d) protect against excessive pressure in the pneumatic system.

21.1.5.0 (551)
(For this question use appendix)Associate the correct legend to each of the numbered diagrams :
a) 1- cantilever 2- fork 3- half fork 4- dual wheels
b) 1- half fork 2- fork 3- cantilever 4- tandem
c) 1- cantilever 2- dual wheels 3- half fork 4- fork
d) 1- half-fork 2- single trace 3- cantilever 4- dual wheels

21.1.5.0 (552)
A scissor is a component found on landing gears. Its function is to :
a) prevent any rotation of the oleo strut in the undercarriage shock absorber.
b) create the wheel pitch on bogie gears.
c) transform the translational movement of the rudder pedals into the rotational movement of the nosewheel.
d) make the body gears pivot when the nosewheel is turned through more than 20°.

21.1.5.0 (553)
Compared to a tyre fitted with an inner tube, a tubeless tyre presents the following characteristics :1 - high heating2 - valve fragility3 - lower risk of bursting4 - better adjustment to wheelsThe combination containing all the correct statements is:
a) 04-Mar
b) 03-Fev
c) 04-Fev
d) 1 - 2 - 3 - 4

21.1.5.0 (554)
On a modern aeroplane, to avoid the risk of tyre burst from overheating, due for example to prolonged braking during an aborted take-off, there is:
a) a hollow bolt screwed into the wheel which melts at a given temperature (thermal fuse) and deflates the tyre.
b) a pressure relief valve situated in the filler valve.
c) the ""Emergency Burst"" function of the anti-skid system which adapts braking to the tyre temperature.
d) water injection triggered at a fixed temperature in order to lower tyre temperature.

21.1.5.0 (555)
On an aircraft landing gear, an under-inflated tyre:
a) will wear at the shoulders
b) it's tread will deteriorate faster
c) will have an increased critical hydroplanning speed
d) will be more subject to viscosity aquaplaning on dry runway

21.1.6.1 (556)
The trim tab :
a) reduces hinge moment and control surface efficiency.
b) reduces hinge moment and increases control surface efficiency.
c) increases hinge moment and control surface efficiency.
d) increases hinge moment and reduces control surface efficiency.

21.1.6.1 (557)
The purpose of a trim tab (device) is to:
a) reduce or to cancel control forces.
b) trim the aeroplane during normal flight.
c) trim the aeroplane at low airspeed.
d) lower manoeuvring control forces.

21.1.6.1 (558)
An artificial feel unit is necessary in the pitch channel when:
a) the elevators are actuated by irreversible servo-control units.
b) the elevators are fitted with servo-tabs or trim tabs.
c) there is a trimmable stabilizer.
d) the elevators are actuated by reversible servo-control units.

21.1.6.1 (559)
An artificial feel unit system:
a) must be mounted in parallel on an irreversible servo-control unit.
b) must be mounted in series on an irreversible servo-control unit.
c) is necessary on a reversible servodyne unit.
d) is mounted in parallel on a spring tab.

21.1.6.1 (560)
A Yaw Damper is :
a) A rudder damper designed to avoid the ""Dutch roll"".
b) An elevator augmentor.
c) An elevator augmentor to avoid the nose-down effect at speeds greater than M=0.8.
d) A roll trim tab.

21.1.6.1 (561)
In a steep turn to the left, when using spoilers ...
a) The right aileron will descend, the left one will ascend, the right spoiler will retract and the left one will extend.
b) The right aileron will descend, the left one will ascend, the right spoiler will extend and the left one will retract.
c) The right aileron will ascend, the left one will descend, the right spoiler will extend and the left one will retract.
d) The right aileron will ascend, the left one will descend, the right spoiler will retract and the left one will extend.

21.1.6.2 (562)
The advantages of fly-by-wire control are:1. reduction of the electric and hydraulic power required to operate the control surfaces2. lesser sensitivity to lightning strike3. direct and indirect weight saving through simplification of systems4. immunity to different interfering signals5. improvement of piloting quality throughout the flight envelopeThe combination regrouping all the correct statements is :
a) 3 and 5
b) 1 and 2
c) 1 and 5
d) 2 and 3

21.1.6.2 (563)
Which of these signals are inputs, at least, in the stall warning computers?
a) Angle of attack and flaps and slats deflection.
b) Angle of attack and flaps and spoilers deflection.
c) Angle of attack, flaps deflection and EPR.
d) Angle of attack, flaps deflection, EPR and N1.

21.1.6.2 (564)
On an aircraft, the Krueger flap is a:
a) leading edge flap
b) trailing edge flap
c) leading edge flap close to the wing root
d) leading edge flap close to the wing tip

21.1.6.2 (565)
The reason for the trim switch on a control column to consist of two separate switches is
a) To reduce the probability of a trim-runaway
b) To prevent that both pilots perform opposite trim inputs.
c) Because there are two trim motors.
d) To be able to use two different trim speeds, slow trim rate at high speed and high trim rate at low speed

21.1.6.2 (566)
On an aeroplane, spoilers are :
a) upper wing surface devices, their deflection is symmetrical or asymmetrical.
b) lower wing surface devices, their deflection is symmetrical or asymmetrical.
c) upper wing surface devices, their deflection is always asymmetrical.
d) lower wing surface devices, their deflection is always asymmetrical.

21.1.6.2 (567)
On an airplane, the Krueger flaps are:
a) leading edge flaps close to the wing root
b) trailing edge flaps close to the wing root
c) trailing edge flaps close to the wing tip
d) leading edge flaps close to the wing tip

21.1.7.1 (568)
Hydraulic fluids must have the following characteristics:1. thermal stability2. low emulsifying characteristics3. corrosion resistance4. good resistance to combustion5. high compressibility6. high volatility7. high viscosityThe combination regrouping all the correct statements is :
a) 1, 2, 3, 4
b) 1, 2, 5, 7
c) 2, 3, 4, 5
d) 1, 3, 4, 6

21.1.7.1 (569)
In a hydraulic braking system, an accumulator is precharged to 1200 psi.An electrically driven hydraulic pump is started and provides a system pressure of 3000 psi. The hydraulic pressure gauge which is connected to the gas section of the accumulator, reads:
a) 3000 psi
b) 1200 psi
c) 4200 psi
d) 1800 psi

21.1.7.1 (570)
Hydraulic fluids :
a) Are irritating to eyes and skin.
b) Cause high fire risk.
c) Do not require special care.
d) Are irritating to eyes and skin and cause high fire risk.

21.1.7.1 (571)
Hydraulic fluids used in systems of large modern airliners are:
a) Phosphate ester base fluids.
b) Water base fluids.
c) Vegetable base fluids.
d) Mineral base fluids.

21.1.7.1 (572)
Hydraulic power is a function of :
a) System pressure and volume flow.
b) Pump RPM only.
c) System pressure and tank capacity.
d) Pump size and volume flow.

21.1.7.1 (573)
Large transport aeroplane hydraulic systems usually operate with a system pressure of approximately:
a) 3000 psi
b) 4000 psi
c) 2000 psi
d) 1000 psi

21.1.7.1 (574)
In hydraulic systems of large modern transport category aircraft the fluids used are:
a) Synthetic oil.
b) Mineral oil.
c) Vegetable oil.
d) Water and glycol.

21.1.7.1 (575)
The type of hydraulic oil used in modern hydraulic systems is:
a) synthetic oil
b) vegetable oil
c) mixture of mineral oil and alcohol
d) mineral oil

21.1.7.1 (576)
The type of hydraulic fluid which has the highest resistance against cavitation is :
a) Synthetic fluid.
b) Mineral oil based fluid.
c) Vegetable oil based fluid (caster oil).
d) Water and glycol based fluid.

21.1.7.1 (577)
The component that transforms the hydraulic pressure into a linear motion is called ...
a) An actuator or jack.
b) A hydraulic pump.
c) An accumulator.
d) A Pressure regulator.

21.1.7.1 (578)
The aircraft hydraulic system is designed to produce:
a) high pressure and large flow.
b) high pressure and small flow.
c) small pressure and large flow.
d) small pressure and small flow.

21.1.7.1 (579)
Hydraulic fluids of synthetic origin are:
a) purple.
b) pink.
c) blue.
d) red.

21.1.7.1 (580)
(For this question use annex 021-6716A)In the hydraulic press schematically shown, what balancing Force would be acting on the right hand side ? (The diagram is not to scale)
a) 100 N.
b) 1000 N.
c) 20 N.
d) 1 N.

21.1.7.1 (581)
Internal leakage in a hydraulic system will cause :
a) an increased fluid temperature.
b) fluid loss.
c) a decreased fluid temperature.
d) an increased fluid pressure.

21.1.7.1 (582)
Discounting the possibility of leak, the level in a hydraulic reservoir will :
a) fluctuate with jack displacement and accumulator pressure.
b) always remain the same.
c) initially increase with system pressurisation.
d) increase as ambient temperature decreases.

21.1.7.1 (583)
Assuming a hydraulic accumulator is pre-charged with air to 1000 psi. If the hydraulic system is then pressurised to its operating pressure of 3000 psi, the indicated pressure on the air side of the accumulator should be :
a) 3000 psi.
b) 2000 psi.
c) 1000 psi.
d) 4000 psi.

21.1.7.1 (584)
For an aeroplane hydraulic supply circuit, the correct statement is :
a) the security components comprise the filters, the pressure relief valves, the by-passes, and the fire shut-off valve.
b) the pumps are always electric due to the high pressures which they must deliver (140 to 210 kg/cm²).
c) the regulation system deals only with emergency operation and is not applied to all hydraulic services but only those considered as essential.
d) the reservoir constitutes a reserve of hydraulic fluid maintained under pressure by a pneumatic back pressure (air or nitrogen) and destined to serve as a fluid or pressure reserve.

21.1.7.2 (585)
Where in a hydraulic system might overheat indicators be installed?
a) At the pumps.
b) In the reservoirs.
c) At actuators.
d) At the coolers.

21.1.7.2 (586)
In a modern hydraulic system, ""hydraulic fuses"" can be found. Their function is :
a) To prevent total system loss in case of a leaking hydraulic line.
b) To switch to the secondary system in case of a leak in the primary brake system.
c) To isolate a part of the system and protect it against accidental pollution.
d) To allow by-passing of a hydraulic pump in case it is subject to excessive pressure, without further damage to the system.

21.1.7.2 (587)
In a hydraulic system, the reservoir is pressurized in order to:
a) prevent pump cavitation
b) seal the system
c) keep the hydraulic fluid at optimum temperature
d) reduce fluid combustibility

21.1.7.2 (588)
The purpose of a shuttle valve is to:
a) Supply an operating unit with the most appropriate system pressure.
b) Protect a hydraulic system from overpressure.
c) Relieve excess pressure in hydraulic systems.
d) Prevent overloading of the hydraulic pump.

21.1.7.2 (589)
Shuttle valves will automatically:
a) Switch hydraulically operated units to the most appropriate pressure supply.
b) Shut down systems which are overloaded.
c) Guard systems against overpressure.
d) Reduce pump loads.

21.1.7.2 (590)
In addition to energy storage the accumulator of the hydraulic system is used :
a) for damping pressure surges in the system.
b) for fluid storage.
c) for pressure storage.
d) as a pressure relief valve.

21.1.7.2 (591)
The hydraulic device similar to an electronic diode is a :
a) check valve.
b) flow control valve.
c) distribution valve.
d) shutoff valve.

21.1.7.2 (592)
The function of the selector valve is to:
a) communicate system pressure to either side of an actuator.
b) select the system to which the hydraulic pump should supply pressure.
c) automatically activate the hydraulic system.
d) discharge some hydraulic fluid if the system pressure is too high.

21.1.7.2 (593)
Assuming an accumulator is pre-charged with air to 1000 psi and the hydraulic system is pressurised to 1500 psi, the accumulator gauge will read :
a) 1500 psi.
b) 2500 psi.
c) 1000 psi.
d) 500 psi.

21.1.7.2 (594)
An accumulator in a hydraulic system will :
a) store fluid under pressure.
b) increase pressure surges within the system.
c) reduce fluid temperature and pressure.
d) reduce fluid temperature only.

21.1.7.2 (595)
(For this question use annex 021-6736A)The schematic diagram annexed illustates a jack and selector valve in a typical hydraulic system. Assuming hydraulic pressure throughout :
a) a condition of hydraulic lock exists and no movement of the jack will take place.
b) since pressures are equal, the jack is free to move in response to external forces.
c) the jack will move to the left due to pressure acting on differential areas.
d) the jack will move to the right due to equal pressure acting on differential areas.

21.1.7.2 (596)
In hydraulic system, a shuttle valve :
a) allows two possible sources of pressure to operate one unit.
b) is a self-lapping non-return valve.
c) allows two units to be operated by one pressure source.
d) regulates pump delivery pressure.

21.1.7.2 (597)
To allow for failure of the normal method of system pressure limiting control, a hydraulic system often incorporates
a) a high pressure relief valve.
b) a stand-by hydraulic pump.
c) an accumulator.
d) auxiliary hydraulic motors.

21.1.7.2 (598)
The hydraulic oil, entering the hydraulic pump, is slightly pressurised to :
a) prevent cavitation in the pump
b) ensure sufficient pump output
c) prevent overheating of the pump.
d) prevent vapour locking.

21.1.7.2 (599)
The Ram Air Turbine (RAT) provides emergency hydraulic power for :
a) flight controls in the event of loss of engine driven hydraulic power.
b) nose wheel steering after the aeroplane has landed.

c) undercarriage selection and automatic brake system.
d) flap extension only.

21.1.7.2 (600)
The tanks of a hydraulic system are pressurized:
a) by bleed air coming from the turbine-engine.
b) in flight only.
c) by the air conditioning system.
d) by an auxiliary system.

21.1.7.2 (601)
The low pressure switch of a hydraulic circuit sets off an alarm if :
a) the pump output pressure is insufficient.
b) the reservoir level is at the normal operation limit.
c) there is a leak in the reservoir return line.
d) the pump power accumulator is deflated.

21.1.8.3 (602)
If the cabin altitude rises (aircraft in level flight), the differential pressure:
a) decreases
b) increases
c) remains constant
d) may exceed the maximum permitted differential unless immediate preventative action is taken.

21.1.8.3 (603)
The purpose of the cabin pressure controller, in the automatic mode, is to perform the following functions:1. control of cabin altitude,2. control of cabin altitude rate-of-change,3. limitation of differential pressure4. balancing aircraft altitude with cabin altitude5. cabin ventilation6. keeping a constant differential pressure throughout all the flight phases.The combination regrouping all the correct statements is :
a) 1, 2, 3
b) 2, 6, 4
c) 5, 6, 1
d) 4, 5, 3

21.1.8.3 (604)
During a normal pressurised climb after take-off:
a) cabin pressure decreases more slowly than atmospheric pressure
b) the pressurisation system is inoperative until an altitude of 10 000 feet is reached
c) the cabin differential pressure is maintained constant
d) absolute cabin pressure increases to compensate for the fall in pressure outside the aircraft

21.1.8.3 (605)
(For this question use annex 021-786A)In a pressurized aircraft whose cabin altitude is 8000 ft, a crack in a cabin window makes it necessary to reduce the differential pressure to 5 psi.The flight level to be maintained in order to keep the same cabin altitude is:
a) FL 230
b) FL 340
c) FL 280
d) FL 180

21.1.8.3 (606)
The purpose of cabin air flow control valves in a pressurization system is to :
a) Maintain a constant and sufficient mass air flow to ventilate the cabin and minimise cabin pressure surges.
b) regulate cabin pressure to the selected altitude.
c) discharge cabin air to atmosphere if cabin pressure rises above the selected altitude.
d) regulate cabin pressure at the maximum cabin pressure differential.

21.1.8.3 (607)
Assuming cabin differential pressure has attained the required value in normal flight conditions, if flight altitude is maintained:
a) a constant mass air flow is permitted through the cabin.
b) the outflow valves will move to the fully open position.
c) the pressurisation system ceases to function until leakage reduces the pressure.
d) the outflow valves will move to the fully closed position.

21.1.8.3 (608)
Cabin pressure is controlled by :
a) delivering a substantially constant flow of air into the cabin and controlling the outflow.
b) controlling the flow of air into the cabin with a constant outflow.
c) the cabin air re-circulation system.
d) the cabin air mass flow control inlet valve(s).

21.1.8.3 (609)
During level flight at a constant cabin pressure altitude (which could be decreased, even at this flight level), the cabin outflow valves are:
a) Partially open.
b) fully closed until the cabin climbs to a selected altitude.
c) At the pre-set position for take-off.
d) Fully closed until the cabin descends to a selected altitude.

21.1.8.3 (610)
The purpose of a ditching control is to:
a) close the outflow valve(s).
b) achieve rapid depressurisation.
c) open the outflow valve(s).
d) direct pressurisation air to the flotation bags.

21.1.8.3 (611)
The cabin pressure is regulated by the:
a) Outflow valve.
b) Air cycle machine.
c) Air conditioning pack.
d) Cabin inlet airflow valve.

21.1.8.3 (612)
The pressurization of the cabin is controlled by :
a) The cabin outflow valve.
b) The cabin inlet airflow.
c) The engine's RPM.
d) The engine's bleed valves.

21.1.8.3 (613)
Cabin differential pressure means the pressure difference between:
a) cabin pressure and ambient air pressure.
b) cockpit and passenger cabin.
c) cabin pressure and ambient air pressure at MSL.
d) actual cabin pressure and selected pressure.

21.1.8.3 (614)
Under normal conditions (JAR 25) the cabin pressure altitude is not allowed to exceed:
a) 8000 ft
b) 4000 ft
c) 6000 ft
d) 10000 ft

21.1.8.3 (615)
Cabin altitude means the:
a) cabin pressure expressed as altitude.
b) difference in height between the cabin floor and ceiling.
c) flight level the aircraft is flying at.
d) flight level altitude at maximum differential pressure.

21.1.8.3 (616)
A warning device alerts the crew in case of an excessive cabin altitude. This warning must be triggered on reaching the following altitude:
a) 10000 ft (approx. 3000 m)
b) 14000 ft (approx. 4200 m)
c) 8000 ft (approx. 2400 m)
d) 12000 ft (approx. 3600 m)

21.1.8.3 (617)
On a modern large pressurized transport aircraft, the maximum cabin differential pressure is approximately:
a) 7 - 9 psi
b) 3 - 5 psi
c) 13 - 15 psi
d) 22 psi

21.1.8.3 (618)
On most modern airliners the cabin pressure is controlled by regulating the:
a) Airflow leaving the cabin.
b) Airflow entering the cabin.
c) RPM of the engine.
d) Bleed air valve.

21.1.8.3 (619)
If the maximum operating altitude of an airplane is limited by the pressurized cabin, this limitation is due to the maximum:
a) Positive cabin differential pressure at maximum cabin altitude.
b) Negative differential pressure at maximum cabin altitude.
c) Positive cabin differential pressure at maximum operating ceiling.
d) Negative cabin differential pressure at maximum operating ceiling.

21.1.8.3 (620)
The ""cabin differential pressure"" is:
a) cabin pressure minus ambient pressure.
b) approximately 5 psi at maximum.
c) approximately 15 psi at maximum.
d) the pressure differential between the air entering and leaving the cabin.

21.1.8.3 (621)
The cabin rate of descent is:
a) a cabin pressure increase.
b) always the same as the airplane's rate of descent.
c) a cabin pressure decrease.
d) is not possible at constant airplane altitudes.

21.1.8.3 (622)
The maximum differential pressure of a transonic transport category airplane is approximately:
a) 9.0 psi
b) 3.5 psi
c) 13.5 psi
d) 15.5 psi

21.1.8.3 (623)
An aircraft with a pressurized cabin is settled at its cruise level.During the flight, a malfunction of the pressure controller is detected by the crew and the cabin rate of climb indicator reads -200ft/min.Given that :DELTA P: Differential pressureZc: Cabin altitude
a) DELTA P will rise up to its maximum value, thus causing the safety relief valves to open.
b) A descent must be initiated to prevent the oxygen masks dropping when Zc reaches 14000ft.
c) The aircraft has to climb to a higher flight level in order to reduce Zc to its initial value.
d) The crew has to intermittently cut off the incoming air flow in order to maintain a zero Zc.

21.1.8.3 (624)
An aircraft with a pressurized cabin flies at level 310.Following a malfunction of the pressure controller, the outflow valve runs to the open position. Given :VZc: Cabin rate of climb indicationZc: Cabin pressure altitudeDELTA P: Differential pressureThis will result in a:
a) VZc increaseZc increaseDELTA P decrease
b) VZc decreaseZc increaseDELTA P decrease
c) VZc increaseZc increaseDELTA P increase
d) VZc decreaseZc decreaseDELTA P increase

21.1.8.3 (625)
In a manually operated system, the cabin altitude rate of change is normally controlled by :
a) a rate of change selector.
b) the difference between the altitude selected on the cabin pressure controller and the aeroplane altitude.
c) the difference between the barometric pressure selected on the cabin pressure controller and ambient barometric pressure.
d) the duct relief valve when operating at the maximum cabin differential pressure.

21.1.8.3 (626)
The term ""pressure cabin"" applies when an aeroplane :
a) has the means to maintain cabin pressure higher than ambient pressure.
b) is only pressurised in the area of the control cabin.
c) has the ability to maintain a constant cabin differential pressure at all flight altitudes.
d) has the ability to maintain a constant cabin altitude at all flight altitudes.

21.1.8.3 (627)
Under normal flight conditions, cabin pressure is controlled by :
a) regulating the discharge of air through the outflow valve(s).
b) pressurisation duct relief valve(s).
c) engine rpm.
d) inward relief valve(s).

21.1.8.3 (628)
Assuming cabin differential pressure has attained the required value in normal flight conditions, if flight altitude is maintained :
a) a constant mass air flow is permitted through the cabin.
b) the pressurisation system ceases to function until leakage reduces the pressure.
c) the outflow valves will move to the fully open position.
d) the pressurisation system must be controlled manually.

21.1.8.3 (629)
Assuming cabin pressure decreases, the cabin rate of climb indicator should indicate :
a) a rate of climb.
b) a rate of descent of approximately 300 feet per minutes.
c) zero.
d) a rate of descent dependent upon the cabin differential pressure.

21.1.8.3 (630)
Assume that during cruise flight with airconditioning packs ON, the outflow valve(s) would close. The result would be that:
a) the pressure differential would go to the maximum value
b) the cabin pressure would become equal to the ambient outside air pressure
c) the air supply would automatically be stopped
d) the skin of the cabin would be overstressed

21.1.8.3 (631)
A cabin pressure controller maintains a pre-set cabin altitude by regulating the :
a) position of the outflow valve(s).
b) mass air flow into the cabin.
c) position of the inward relief valve.
d) position of the duct relief valve(s).

21.1.8.3 (632)
If the pressure in the cabin tends to become lower than the outside ambient air pressure the :
a) negative pressure relief valve will open.
b) negative pressure relief valve will close
c) outflow valve open completely.
d) air cycle machine will stop.

21.1.8.4 (633)
The pneumatic ice protection system is mainly used for:
a) wings.
b) pitot tubes.
c) propellers.
d) engine intakes.

21.1.8.4 (634)
With regard to the pneumatic mechanical devices which afford protection against the formation of ice, the only correct statement is:
a) The pneumatic mechanical device can only be used as a de-icing device.
b) The pneumatic mechanical device is used a lot on modern aircraft as it is inexpensive and easy to maintain.
c) The pneumatic mechanical device can only be used as an anti-icing device.
d) The inflatable de-ice boots of the pneumatic mechanical device are arranged perpendicular to the leading edges.

21.1.8.4 (635)
A pneumatic de-ice system should be operated ..
a) When there is approximately 1,5 cm of ice on leading edges.
b) When entering areas with icing conditions.
c) When there are approximately 5 cm of ice on leading edges
d) Only at take-off and during approach.

21.1.8.4 (636)
Concerning the sequential pneumatic impulses used in certain leading edge de-icing devices, one can affirm that :1 - They prevent ice formation.2 - They are triggered from the flight deck after icing has become visible.3 - A cycle lasts more than ten seconds.4 - There are more than ten cycles per second.The combination which regroups all the correct statements is :
a) 03-Fev
b) 04-Fev
c) 03-Jan
d) 04-Jan

21.1.9.1 (637)
The pneumatic system accumulator is useful :
a) to eliminate the fluid pressure variations.
b) to eliminate the fluid flow variations.

c) to offset for the starting of some devices.
d) in emergency cases.

21.1.9.1 (638)
In the pneumatic supply system of a modern transport aircraft, the air pressure is regulated. This pressure regulation occurs just before the manifold by the :
a) low pressure bleed air valve
b) high pressure bleed air valve
c) fan bleed air valve
d) intermediate pressure check-valve

21.1.9.2 (639)
In the air cycle system the air is cooled down by expansion:
a) in the turbine.
b) in a pressure relief valve.
c) of Freon in a heat exchanger.
d) of Freon in the turbine.

21.1.9.2 (640)
Main cabin temperature is:
a) controlled automatically, or by flight crew selection.
b) controlled by individual passenger.
c) not controllable at the maximum cabin differential pressure.
d) Only controllable at maximum cabin differential pressure.

21.1.9.2 (641)
Environmental system: in the air refrigeration unit, the water separation unit is placed:
a) after the cooling turbine.
b) before the heat exchangers.
c) before the cooling turbine.
d) just after the heat exchangers.

21.1.9.2 (642)
The air-conditioning pack of a present-day aircraft consists of several components: these include two heat exchangers, the primary exchanger (P) and the secondary exchanger (S).The functions of these heat exchangers are as follows:
a) P: precools the engine bleed airS: reduces the temperature of the air from the primary exchanger or from the pack's compressor.
b) P: warms up engine bleed airS: recirculates the cabin air, reducing its temperature.
c) P: warms up engine bleed airS: increases the temperature of air originating from the compressor of the pack.
d) P: pre-cools the engine bleed airS: increases the temperature of the air used for air-conditioning of cargo compartment (animals).

21.1.9.2 (643)
""Conditioned"" air is air that has:
a) been controled in respect of temperature and pressure.
b) oxygen content regulated to a preset value.
c) oxygen content increased.
d) oxygen content reduced.

21.1.9.2 (644)
The term ""cabin pressure"" applies when an aeroplane:
a) has the means to maintain the cabin pressure at a higher level than the ambient pressure.
b) is only pressurized in the area of the control cabin.
c) has the ability to maintain constant any cabin differential pressure.
d) has the ability to maintain a constant cabin altitude at all flight altitudes.

21.1.9.2 (645)
When air is compressed for pressurization purposes, the percentage oxygen content is:
a) unaffected.
b) decreased.
c) increased.
d) dependent on the degree of pressurisation.

21.1.9.2 (646)
The term ""bootstrap"", when used to identify a cabin air conditioning and pressurisation system, refers to the:
a) cold air unit (air cycle machine) arrangement.
b) source of the charge air.
c) means by which pressurisation is controlled.
d) charge air across the inter-cooler heat exchanger.

21.1.9.2 (647)
In a bootstrap cooling system the supply air is first:
a) compressed, then goes through a heat exchanger, and across an expansion turbine.
b) passed across an expansion turbine, then compressed and passed through a heat exchanger.
c) passed across an expansion turbine, then directly to the heat exchanger.
d) compressed, then passed across an expansion turbine through a heat exchanger.

21.1.9.2 (648)
In a cabin air conditioning system, equipped with a bootstrap, the mass air flow is routed via the:
a) secondary heat exchanger outlet to the turbine inlet of the cold air unit.
b) secondary heat exchanger outlet to the compressor inlet of the cold air unit.
c) turbine outlet of the cold air unit to the primary heat exchanger inlet.
d) compressor outlet of the cold air unit to the primary heat exchanger inlet.

21.1.9.2 (649)
Engine bleed air used for air conditioning and pressurization in turbo-jet aeroplanes is usually taken from the:
a) compressor section.
b) fan section.
c) turbine section.
d) by-pass ducting.

21.1.9.2 (650)
What is the purpose of the pack cooling fans in the air conditioning system?

a) Supplying the heat exchangers with cooling air during slow flights and ground operation.
b) Supplying the heat exchangers with cooling air during cruise flight.
c) Supplying the Passenger Service Unit (PSU) with fresh air.
d) Cooling of the APU compartment.

21.1.9.2 (651)
The cabin air for modern airplanes is usually supplied by:
a) main engine compressors.
b) piston compressors.
c) roots type compressors.
d) single radial compressors.

21.1.9.2 (652)
Cabin air for modern aircraft is usually taken from:
a) the low pressure compressor and from the high pressure compressor if necessary.
b) the second fan stage.
c) the low pressure compressor.
d) the high pressure compressor.

21.1.9.2 (653)
In an aircraft air conditioning system the air cannot be treated for:
a) humidity.
b) purity.
c) pressure.
d) temperature.

21.1.9.2 (654)
In a bootstrap system, the purpose of the heat exchangers is to:
a) cool bleed air and compressor air from the turbo refrigerator.
b) allow a homogeneous temperature by mixing air flows from various air conditioning groups in operation.
c) cool bleed air.
d) allow a steady compressor outlet temperature.

21.1.9.2 (655)
The turbine in a cold air unit (air cycle machine):
a) drives the compressor in the unit, creating a temperature drop in the conditioning air.
b) drives the compressor which provides pressurisation.
c) increases the pressure of the air supply to the cabin.
d) drives the compressor in the unit and causes a pressure increase in the conditioning air.

21.1.9.2 (656)
In large modern aircraft, in the air conditioning system, reduction of air temperature and pressure is achieved by:
a) an expansion turbine.
b) a compressor.
c) a condenser.
d) an evaporator.

21.1.9.2 (657)
In a ""bootstrap"" cooling system, the charge air is first compressed in the cold air unit to:
a) ensure an adequate pressure and temperature drop across the cooling turbine.
b) increase the cabin air supply pressure when the charge pressure is too low.
c) ensure an adequate charge air flow across the inter-cooler heat exchanger.
d) maintain a constant cabin mass air flow.

21.1.9.2 (658)
A turbo-fan cold air unit will:
a) cause a pressure drop as well as an associated temperature drop in the charge air.
b) not affect the charge air pressure.
c) increase charge air pressure whilst causing hte temperature to drop in the heat exchanger.
d) decrease charge air pressure whilst causing hte temperature to rise in the heat exchanger.

21.1.9.2 (659)
The cabin heating supply in a heavy jet transport aircraft is obtained from :
a) hot air coming from the engine's compressors.
b) hot air coming from the engine's turbines.
c) a fuel heater system.
d) an electrical heater system.

21.1.9.2 (660)
The pack cooling fan provides:
a) cooling air to the primary and secondary heat exchanger during slow flight and ground operation.
b) cooling air to the pre-cooler.
c) air to the eyeball outlets at the Passenger Service Unit (PSU).
d) cooling air to the primary and secondary heat exchanger during cruise.

21.1.9.2 (661)
The water separator of an air-conditioning unit is located at the cooling unit :
a) outlet and uses a centrifugal process.
b) inlet and uses a centrifugal process.
c) outlet and uses an evaporation process.
d) inlet and uses an evaporation process.

21.1.9.2 (662)
The term ""Bootstrap"", when used to identify a cabin air conditioning and pressurisation system, refers to the :
a) cold air unit (air cycle machine) arrangement.
b) source of the charge air.
c) means by which pressurisation is controlled.
d) charge air across the inter-cooler heat exchanger.

21.1.9.2 (663)
In a bootstrap cooling system the supply air is first :
a) compressed, passed through a secondary heat exchanger, and then across an expansion turbine.
b) passed across an expansion turbine, then compressed and passed through a secondary

heat exchanger.
c) passed across an expansion turbine, then directly to the heat exchanger.
d) used to increase the cabin air supply pressure when the charge pressure is too low.

21.1.9.2 (664)
The function of an air cycle machine is to :
a) cool the bleed air.
b) decrease the pressure of the bleed air.
c) remove the water from the bleed air.
d) pump the conditioned air into the cabin.

21.1.9.2 (665)
""Conditioned"" air is air that has :
a) been controlled in respect of temperature and pressure.
b) had any moisture removed from it.
c) had the oxygen content increased.
d) had the oxygen content reduced.

21.1.9.3 (666)
In flight, the most commonly used anti-icing method for the wings of modern commercial aircraft fitted with turbo-jet units is:
a) Thermal (use of hot air).
b) Physical/chemical (glycol-based liquid).
c) Electrical (electrical resistances).
d) Mechanical (pneumatic source which acts by deforming the profiles of the leading edge).

21.1.9.3 (667)
Concerning electrically powered ice protection devices, the only true statement is:
a) on modern aeroplanes, electrically powered thermal devices are used to prevent icing on small surfaces (pitot-static, windshield...).
b) on modern aeroplanes, electrical power supply being available in excess, this system is very often used for large surfaces de-icing.
c) on modern aeroplanes, electrically powered thermal devices are very efficient, therefore they only need little energy.
d) on modern aeroplanes, electrically powered thermal devices are used as de-icing devices for pitot-tubes, static ports, windshield...

21.1.9.3 (668)
The elements specifically protected against icing on transport aircraft are:1) engine air intake and pod.2) front glass shield.3) radome.4) pitot tubes and waste water exhaust masts.5) leading edge of wing.6) cabin windows.7) trailing edge of wings.8) electronic equipment compartment.The combination regrouping all the correct statements is :
a) 1, 2, 4, 5
b) 1, 4, 5, 7
c) 1, 2, 5, 6
d) 1, 2, 3, 8

21.1.9.3 (669)
The ice protection system currently used for the most modern jet aeroplanes is the
a) Hot air system.
b) Pneumatic system with expandable boots.
c) Liquid de-icing system.
d) Electrical de-icing system.

21.1.9.3 (670)
During flight, the wing anti-ice system has to protect
a) leading edges, slats and the leading edge flaps.
b) the whole upper wing surface and the flaps.
c) slats and the leading edge flaps only.
d) leading edges only.

21.1.9.3 (671)
In jet aeroplanes the 'thermal anti-ice system' is primary supplied by
a) bleed air from the engines.
b) turbo compressors.
c) ram air, heated via a heat exchanger.
d) the APU.

21.1.9.3 (672)
The anti-ice or de-icing system which is mostly used for the wings of modern turboprop aeroplanes is :
a) Pneumatic boots.
b) Electrical heating.
c) Thermal anti-icing.
d) Fluid de-icing.

21.1.9.3 (673)
The ice protection for propellers of modern turboprop aeroplanes works
a) electrically.
b) pneumatically.
c) with hot air.
d) with anti-icing fluid.

21.1.9.3 (674)
The advantages of thermal anti-icing are :1. Simple and reliable system2. Profiles maintained3. Greater efficiency than that of an electrical resistor4. Direct use of the hot air from the jet engine without substantial reduction in engine thrustThe combination of correct statements is:
a) 1,2
b) 3,4
c) 1,3
d) 2,4

21.1.10.1 (675)
On modern transport aircraft, cockpit windows are protected against icing by :
a) Electric heating.
b) Vinyl coating.
c) Anti-icing fluid.
d) Rain repellent system.

21.1.10.1 (676)
Usually, electric heating for ice protection is used on:
a) Pitot tubes.
b) Elevator leading edges.
c) Slat leading edges.
d) Fin leading edges.

21.1.10.1 (677)
The heating facility for the windshield of an aircraft is:
a) Used on a continual basis as it reduces the thermal gradients which adversely affect the useful life of the components.
b) Harmful to the integrity of the windows in the event of a bird strike.
c) Only used when hot-air demisting is insufficient.
d) Used only at low altitudes where there is a risk of ice formation.

21.1.10.1 (678)
The correct statement about rain protection for cockpit windshields is that :
a) rain repellent should never be sprayed onto the windshield unless the rainfall is very heavy
b) wipers are sufficient under heavy rain conditions to provide adequate view through the cockpit windows.
c) the electric de-icing system for cockpit windows is also suitable for rain protection
d) the alcohol de-icing system for cockpit windows is also suitable for rain protection

21.1.11.1 (679)
The purpose of the baffles in an aircraft's integral fuel tank is to:
a) Restrict the fuel from flowing to the wing tips during abnormal manoeuvre (side slipping...).
b) Prevent overpressure in the tank.
c) Prevent the fuel from flowing in the vent lines.
d) Prevent mixture of the fuel and hydraulic fluid.

21.1.11.1 (680)
On a transport type aircraft the fuel tank system is vented through:
a) Ram air scoops on the underside of the wing.
b) A pressure regulator in the wing tip.
c) Bleed air from the engines.
d) The return lines of the fuel pumps.

21.1.11.1 (681)
The types of fuel tanks used on most modern transport aircraft are:
a) Integral tanks.
b) Cell tanks.
c) Combined fuel tanks.
d) Fixed built-in tanks.

21.1.11.1 (682)
The purpose of baffle check valves fitted in aircraft fuel tanks is to :
a) prevent fuel movement to the wing tip.
b) damp out movement of the fuel in the tank.
c) close the vent lines in case of turbulence.
d) prevent positive pressure build up inside the tank.

21.1.11.1 (683)
The pressurization of tanks is maintained by the fuel:
a) vent system.
b) tank drains.
c) top off unit.
d) dump system.

21.1.11.1 (684)
The automatic fuelling shut off valve:
a) stops fuelling as soon as a certain fuel level is reached inside the tank.
b) cuts off the fuel in case of engine fire.
c) stops fuelling as soon as the fuel spills into the ventline.
d) stops fuelling as soon as a certain pressure is reached.

21.1.11.1 (685)
Fire precautions to be observed before refuelling are :
a) All bonding and earthing connections between ground equipment and the aircraft should be made before filler caps are removed.
b) Ground Power Units (GPU) are not to be operated.
c) Passengers may be boarded (traversing the refuelling zone) providing suitable fire extinguishers are readily available.
d) Aircraft must be more than 10 metres from radar or HF radio equipment under test.

21.1.11.1 (686)
The function of a feed box in the fuel tank is to
a) increase the fuel level at the boost pump location
b) trap fuel sediments or sludge in the lower part of the tank
c) distribute the fuel to the various tanks during refuelling
d) ventilate the tank during refuelling under high pressure

21.1.11.2 (687)
On most transport aircraft, the low pressure pumps of the fuel system are:
a) centrifugal pumps, driven by an electric motor.
b) electro-mechanical wobble pumps, with self-regulated pressure.
c) mechanically driven by the engine's accessory gearbox.
d) removable only after the associated tank has been emptied.

21.1.11.2 (688)
The fuel supply system on a jet engine includes a fuel heating device, upstream of the main fuel filter so as to:
a) prevent, at low fuel temperature, the risk of ice formation from water contained in the fuel.
b) maintain and improve fuel heating power.
c) ease low pressure pumps work by increasing fuel fluidity.
d) prevent fuel from freezing in fuel pipes due to low temperatures at high altitude.

21.1.11.2 (689)
On most transport jet aircraft, the low pressure pumps of the fuel system are supplied with electric power of the following type:
a) 115 V AC
b) 28 V AC
c) 28 V DC
d) 115 V DC

21.1.11.2 (690)
The fuel crossfeed system:
a) allows feeding of any engine from any fuel tank.
b) is only used to feed an engine from the tank of the opposite wing.
c) is only used on the ground for fuel transfer from one tank to another.
d) is only used in flight for fuel transfer from one tank to another.

21.1.11.2 (691)
On most transport aircraft, the low pressure pumps of the fuel system are:
a) Centrifugal pumps.
b) Gear type pumps.
c) Piston pumps.
d) Diaphragm pumps.

21.1.11.2 (692)
On a jet aircraft fuel heaters are :
a) Located on the engines.
b) Installed in each tank.
c) Installed only in the center tank.
d) not necessary at all.

21.1.11.2 (693)
During fuelling the automatic fuelling shut off valves will switch off the fuel supply system when:
a) the fuel has reached a predetermined volume or mass.
b) fuelling system has reached a certain pressure.
c) the surge vent tank is filled.
d) there is fire.

21.1.11.2 (694)
The cross-feed fuel system is used to :
a) feed every engine from any fuel tank.
b) allow the fuel to be quickly thrown away in case of emergency
c) allow the unusable fuel elimination.
d) automatically fill every tank up to the desired level.

21.1.11.2 (695)
The fuel system boost pumps are submerged in the fuel ..
a) To prime the pumps.
b) Because their efficiency is greater.
c) To shorten the fuel lines, so minimising the pressure losses.
d) To cool the pumps.

21.1.11.2 (696)
The refueling in a transport jet aircraft is made ...
a) Through a unique point (an underwing refueling center).
b) Through the refueling cap of every tank
c) By means of the aircraft suction pumps.
d) By means of the aircraft suction pumps through a unique point (an underwing refueling center).

21.1.11.2 (697)
The vapor lock is :
a) A stoppage in a fuel feeding line caused by a fuel vapor bubble.
b) The exhaust gases obstructions caused by an engine overheating.
c) The effect of the water vapor bubbles in the induction manifold caused by the condensation
d) The abnormal mixture enrichment caused by a greater gasoline vaporisation in the carburettor.

21.1.11.2 (698)
The fuel system boost pumps are used to :
a) avoid the bubbles accumulation and feed the lines with fuel for directing it to the engine at a positive pressure.
b) avoid the bubbles accumulation.
c) feed the lines with fuel for directing it to the engine at a positive pressure.
d) feed the fuel control units, which inject the pressurized fuel into the engine.

21.1.11.2 (699)
The cross-feed fuel system enables:
a) the supply of any jet engine from any fuel tank.
b) the supply of the jet engines mounted on a wing from any fuel tank within that wing.
c) the supply of the outboard jet engines from any outboard fuel tank.
d) only the transfer of fuel from the centre tank to the wing tanks.

21.1.11.2 (700)
Fuel pumps submerged in the fuel tanks of a multi-engine aircraft are:
a) centrifugal low pressure type pumps.
b) low pressure variable swash plate pumps.
c) centrifugal high pressure pumps.
d) high pressure variable swash plate pumps.

21.1.11.3 (701)
Fuel dump systems are required:
a) on all transport category aircraft where the Maximum Take-Off Weight (MTOW) is significant higher than the Maximum Landing Weight (MLW).
b) on all transport category aircraft.
c) on all transport category aircraft with more than 150 seats.
d) on aircraft with a Maximum Take-Off Weight (MTOW) higher than 5.7 tons.

21.1.11.3 (702)
The maximum quantity of fuel that can be dumped with the jettisoning system is:
a) All up to a defined reserve quantity.
b) 15 tons.

c) All fuel.
d) All fuel until the maximum landing weight is reached.

21.1.11.4 (703)
(For this question use annex 021-980A)The diagram shown in annex represents a jet fuel system. The fuel-flow measurement is carried out :
a) after high pressure valve (item 4).
b) in the fuel control unit (item 3).
c) after high pressure pump first stage (item 2).
d) after low pressure valve (item 1).

21.1.11.4 (704)
The capacitance type fuel gauging system indicates the fuel quantity by measuring the:
a) dielectric change between fuel and air.
b) density variation of the fuel.
c) resistivity variation of the fuel.
d) electrical resistance change.

21.1.11.4 (705)
In a compensated capacitance type quantity indicating system, the contents gauge of a half-full fuel tank indicates a fuel mass of 8000 lb. If a temperature rise increased the volume of fuel by 5 %, the indicated fuel weight would :
a) remain the same.
b) increase by 5 %.
c) decrease by 5 %.
d) increase by 10 %.

21.2.1.1 (706)
Fuses are rated to a value by :
a) the number of amperes they will carry.
b) the number of volts they will pass.
c) their wattage.
d) their resistance measured in ohms.

21.2.1.1 (707)
The difference between (1) a fuse and (2) a circuit breaker is:
a) (1)not resettable, (2)resettable.
b) (1) suitable for high currents, (2) not suitable for high currents.fuse circuit breaker
c) (1) not suitable for high currents, (2) suitable for high currents.fuse circuit breaker
d) (1)not resettable, (2) not resettable.

21.2.1.1 (708)
An aircraft electrical circuit which uses the aircraft structure as a return path to earth, may be defined as a
a) single pole circuit.
b) complete negative system.
c) double pole circuit.
d) semi-negative system.

21.2.1.1 (709)
When an ""open circuit"" occurs in an electrical supply system, the :
a) loss of continuity will prevent its working components from functioning.
b) fuse or CB should isolate the circuit due to excess current drawn.
c) component will operate normally, but will not switch off.
d) load as indicated by the ammeter will increase.

21.2.1.1 (710)
If a current is passed through a conductor which is positioned in a magnetic field :
a) a force will be exerted on the conductor.
b) the current will increase.
c) there will be no effect unless the conductor is moved.
d) the intensity of the magnetic field will decrease.

21.2.1.1 (711)
A current limiter fuse in a DC generation system is used to :
a) allow a short term overload before rupturing.
b) limit the current in the field circuit.
c) instantaneously rupture to limit the current in the load.
d) limit the current in the armature.

21.2.1.1 (712)
The true statement among the following in relation to the application of Ohm's law is :
a) Current in a circuit is directly proportional to the applied electromotive force.
b) The current in a circuit is directly proportional to the resistance of the circuit.
c) power in the circuit is inversely proportional to the square of the current.
d) current in a circuit is inversely proportional to the electromotive force.

21.2.1.1 (713)
A condenser in parallel with breaker points will
a) intensify current in secondary winding
b) permit arcing across points
c) assist in negative feedback to secondary coil
d) assist in collapse of secondary winding.

21.2.1.1 (714)
The connection in parallel of two 12 volt/ 40 amphours batteries, will create a unit with the following characteristics,
a) 12 volt / 80 amp hours
b) 12 volt / 40 amp hours
c) 24 volt / 80 amp hours
d) 24 volt / 40 amp hours

21.2.1.1 (715)
The resistors R1 and R2 are connected in parallel. The value of the equivalent resistance (Req) so obtained is given by the following formula:
a) 1/Req = 1/R1 + 1/R2
b) Req = R1 + R2
c) Req = R1 x R2
d) 1/Req = 1/(R1 + R2)

21.2.1.2 (716)
If one of the 12 cells of a lead-acid battery is dead, the battery:
a) is unserviceable.
b) has 1/12 less voltage, but can still be used.
c) has 1/12 less capacity, but can still be used.
d) has 1/12 less voltage and less capacity, but can still be used.

21.2.1.2 (717)
In aeronautics, the most commonly used batteries are NiCd because...
a) they weigh less than lead-acid batteries.
b) their output voltage is more constant than lead-acid batteries.
c) their electrolyte is neither corrosive nor dangerous.
d) they are cheaper than lead-acid batteries.

21.2.1.2 (718)
On board present aircraft, the batteries used are mainly Cadmium-Nickel. Their advantages are:1. low risk of thermal runaway2. high internal resistance, hence higher power3. good charging and discharging capability at high rating4. wider permissible temperature range5. good storage capability6. sturdiness owing to its metal casing7. the electrolyte density remains unchanged during charging.The combination of correct statement is:
a) 3, 4, 5, 6
b) 1, 2, 5, 6, 7
c) 2, 3, 4, 5, 6
d) 3, 4, 6, 7

21.2.1.2 (719)
The voltage of a fully charged lead-acid battery cell is :
a) 2,2 volts.
b) 1,4 volts.
c) 1,8 volts.
d) 1,2 volts.

21.2.1.2 (720)
Batteries are rated in :
a) Amperes.hours.
b) Amperes/volts.
c) Watts.
d) Ohms.

21.2.1.2 (721)
When carrying out battery condition check using the aircraft's voltmeter :
a) a load should be applied to the battery in order to give a better indication of condition.
b) no load should be applied to the battery because it would depress the voltage.
c) the battery should be isolated.
d) the load condition is unimportant.

21.2.1.2 (722)
Connecting two 12 volt 40 ampere-hour capacity batteries in series will result in a total voltage and capacity respectively of :
a) 24 volts, 40 ampere-hours.
b) 12 volts, 40 ampere-hours.
c) 24 volts, 80 ampere-hours.
d) 12 volts, 80 ampere-hours.

21.2.1.2 (723)
The capacity of a battery is expressed in terms of :
a) ampere-hours.
b) volts.
c) watts.
d) internal resistance.

21.2.1.2 (724)
A test to assess the state of charge of a lead-acid battery would involve :
a) comparing the ""on-load"" and ""off-load"" battery voltages.
b) checking the level of the electrolyte.
c) checking the discharge current of the battery ""on-load"".
d) checking the battery voltage ""off-load"".

21.2.1.2 (725)
When a battery is almost fully discharged there is a tendency for the :
a) voltage to decrease under load.
b) voltage to increase due to the current available.
c) current produced to increase due to the reduced voltage.
d) electrolyte to ""boil"".

21.2.1.2 (726)
Immediately after starting engine(s) with no other electrical services switched on, an ammeter showing a high charge rate to the battery :
a) would be normal and is only cause for concern if the high charge rate persists.
b) indicates a battery failure since there should be no immediate charge.
c) indicates a generator failure, thus requiring the engine to be shut down immediately.
d) indicates a faulty reverse current relay.

21.2.1.3 (727)
A relay is :
a) An electromagnetically operated switch.
b) An electrical security switch.
c) A switch specially designed for AC circuits.
d) An electrical energy conversion unit.

21.2.1.3 (728)
A relay is :
a) a magnetically operated switch.
b) another name for a solenoid valve.
c) a unit which is used to convert electrical energy to heat energy.
d) a device which is used to increase electrical power.

21.2.1.3 (729)
When a conductor cuts the flux of a magnetic field :

a) an electromotive force (EMF) is induced in the conductor.
b) there will be no effect on the conductor.
c) the field will collapse.
d) current will flow in accordance with Flemings left hand rule.

21.2.1.3 (730)
A circuit breaker :
a) may be reset manually after the fault has been rectified.
b) is self resetting after the fault has been rectified.
c) can only be reset after major maintenance.
d) can be reset on the ground only.

21.2.1.3 (731)
Circuit breakers protecting circuits may be :
a) used in AC and DC circuits.
b) used only in AC circuits.
c) used only in DC circuits.
d) reset at any time.

21.2.1.3 (732)
A ""trip-free"" type circuit breaker is a circuit protection device which :
a) will not allow the contacts to be held closed while a current fault exists in the circuit.
b) is free from the normal CB tripping characteristic.
c) can be reset at any time.
d) will allow the contacts to be held closed in order to clear a fault in the circuit.

21.2.1.4 (733)
In order to produce an alternating voltage of 400 Hz, the number of poles required in an AC generator running at 6000 rpm is:
a) 4
b) 24
c) 12
d) 8

21.2.1.4 (734)
In a generator, the Constant Speed Drive (CSD):1- may be disconnected from the engine shaft.2- may be disconnected from the generator.3- is a hydro-mechanical system.4- is an electronic system.5- may not be disconnected in flight.6- may be disconnected in flight.The combination regrouping all the correct statements is :
a) 1, 3, 6
b) 1, 2, 5
c) 2, 3, 4
d) 1, 4, 5

21.2.1.4 (735)
In an alternator rotor coil you can find :
a) AC.
b) Three-phase AC.
c) Only induced current.
d) DC.

21.2.1.4 (736)
Assume a constant speed DC generator providing a constant output voltage. If the electrical load increases, the voltage regulator will :
a) increase the intensity of the excitation current.
b) change the direction of the excitation current.
c) maintain the intensity of the excitation current constant.
d) decrease the intensity of the excitation current.

21.2.1.4 (737)
The essential difference between aircraft AC alternators and DC generators (dynamos) is that the:
a) induced (output) windings of the alternators are fixed (stator), and the dynamos have a fixed inductor (field) coil.
b) induced windings of the alternators are rotating (rotor), and the dynamos have a rotary inductor coil.
c) alternators supply all of the output current through the commutators and brush assemblies.
d) The alternators generate much less power than DC generators.

21.2.1.4 (738)
A feeder fault on a direct current circuit results from a flux unbalance between the:
a) voltage coil and the series winding turn.
b) voltage coil and the series winding.
c) generator and the series winding turn.
d) shunt exciter and the series winding turn.

21.2.1.4 (739)
The detection of a feeder fault on a direct current circuit results in:1. automatic disconnection of the generator from the aircraft AC busbar2. opening of generator field current relay3. opening of the main relay of the generator breaker4. opening of balancing circuit connecting two generators5. lighting of an indicator lampThe combination of correct statements is:
a) 1, 2, 3, 4, 5
b) 2, 3, 4, 5
c) 2, 4, 5
d) 1, 3, 5

21.2.1.4 (740)
A DC generator fitted to a aircraft is cooled by :
a) air via a ram air intake.
b) water at 8 degrees centrigade from the air-conditioning system.
c) a fan located before the generator.
d) air tapped from the low pressure compressor.

21.2.1.4 (741)
The voltage regulator of a DC generator is connected in :
a) series with the shunt field coil.
b) series with the armature.
c) parallel with the shunt field coil.
d) parallel with the armature.

21.2.1.4 (742)
The output of a generator is controlled by :
a) varying the field strength.
b) varying the speed of the engine.
c) varying the length of wire in the armature windings.
d) the reverse current relay circuit breaker.

21.2.1.4 (743)
In order that DC generators will achieve equal load sharing when operating in parallel, it is necessary to ensure that :
a) their voltages are almost equal.
b) the synchronising bus-bar is disconnected from the busbar system.
c) equal loads are connected to each generator busbar before paralleling.
d) adequate voltage differences exists.

21.2.1.4 (744)
On-board electrical systems are protected against faults of the following type:1. AC generator over-voltage2. AC generator under-voltage3. over-current4. over-speed5. under-frequency6. undue vibration of AC generatorsThe combination of correct statements is :
a) 1,2,4,5
b) 1,2,4,6
c) 1,3,5,6
d) 2,3,4,5,6

21.2.1.4 (745)
The frequency of the current provided by an alternator depends on...
a) its rotation speed
b) the strength of the excitation current
c) its load
d) its phase balance

21.2.1.4 (746)
The function of the Generator Breaker is to close when the voltage of the :
a) generator is greater than battery voltage and to open when the opposite is true
b) battery is greater than the generator voltage and to open when the opposite is true
c) alternator is greater than the battery voltage and to open when the opposite is true
d) battery is greater than the alternator voltage and to open when the opposite is true

21.2.1.5 (747)
The so-called ""hot buses"" or ""direct buses"" are:
a) directly connected to the battery.
b) kept in operating conditions by an electrical resistance in the case of energy failure.
c) automatically connected to the battery if generators have failed.
d) providing an alternative current.

21.2.1.5 (748)
The type of windings commonly used in DC starter motors are :
a) series wound.
b) shunt wound.
c) series shunt wound.
d) compound wound.

21.2.1.5 (749)
A bus-bar is :
a) a distribution point for electrical power.
b) a device permitting operation of two or more switches together.
c) the stator of a moving coil instrument.
d) a device which may only be used in DC circuits.

21.2.1.5 (750)
When two DC generators are operating in parallel, control of load sharing is achieved by :
a) an equalising circuit which, in conjunction with the voltage regulators, varies the field excitation current of the generators.
b) an equalising circuit which, in turn, controls the speed of the generators.
c) carrying out systematic load-shedding procedures.
d) the synchronous bus-bar.

21.2.1.5 (751)
In a two generator system, a differential relay will ensure that :
a) generator voltages are almost equal before the generators are paralleled.
b) only one generator can supply the bus-bar at a time.
c) generator voltages are not equal, dependent on load.
d) one generator comes ""on-line"" before the other.

21.2.1.5 (752)
The purpose of a battery protection unit is generally to isolate the battery:1 - from the bus when the battery charge is deemed satisfactory2 - when there is a battery overheat condition3 - in case of an internal short circuit4 - in case of a fault on the ground power unitThe combination which regroups all of the correct statements is :
a) 2001-02-03
b) 02-Jan
c) 1 - 2 - 3 -4
d) 1

21.2.1.6 (753)
A static inverter is a:
a) transistorized unit used to convert DC into AC.
b) device for reversing the polarity of the static charge.
c) static discharger.
d) filter against radio interference.

21.2.1.6 (754)
The reason for using inverters in an electrical system is ..
a) To change DC into AC.
b) To change the DC voltage.
c) To change AC into DC.
d) To avoid a short circuit.

21.2.1.6 (755)
In an aircraft equipped with a DC main power system, AC for instrument operation may be obtained from :
a) an inverter.
b) a rectifier.
c) a contactor.
d) a TRU.

21.2.1.6 (756)
A unit that converts electrical DC into AC is :
a) an inverter.
b) an AC generator.
c) a transformer rectifier unit.
d) a thermistor.

21.2.1.7 (757)
Static dischargers :1. are used to set all the parts of the airframe to the same electrical potential2. are placed on wing and tail tips to facilitate electrical discharge3. are used to reset the electrostatic potential of the aircraft to a value approximating 0 volts4. are located on wing and tail tips to reduce intererence with the on-board radiocommunication systems to a minimum5. limit the risks of transfer of electrical charges between the aircraft and the electrified cloudsThe combination regrouping all the correct statements is :
a) 2,4,5.
b) 1,2,5.
c) 1,3,4.
d) 3,4,5.

21.2.1.7 (758)
The advantages of grounding the negative pole of the aircraft structure are:1. Weight saving2. Easy fault detection3. Increase of short-circuit risk4. Reduction of short-circuit risk5. Circuits are not single-wired linesThe combination regrouping all the correct statements is :
a) 1, 2, 4
b) 1, 2, 3
c) 2, 3, 5
d) 1, 3, 5

21.2.1.7 (759)
Electrical bonding of an aircraft is used to:1. protect the aircraft against lightning effects.2. reset the electrostatic potential of the aircraft to a value approximating 0 volt3. reduce radio interference on radiocommunication systems4. set the aircraft to a single potentialThe combination regrouping all the correct statements is:
a) 1, 3, 4
b) 1, 2, 3
c) 3, 4
d) 2, 4

21.2.1.7 (760)
The purpose of static wick dischargers is to :
a) dissipate static charge of the aircraft inflight thus avoiding radio interference as a result of static electricity.
b) dissipate static charge from the aircraft skin after landing.
c) provide a path to ground for static charges when refuelling.
d) be able to fly higher because of less electrical friction.

21.2.1.7 (761)
It may be determined that an aircraft is not properly bonded if :
a) static noises can be heard on the radio.
b) a circuit breaker pops out.
c) there is interference on the VOR receiver.
d) there is heavy corrosion on the fuselage skin mountings.

21.2.1.7 (762)
The primary purpose of bonding the metallic parts of an aircraft is to :
a) provide safe distribution of electrical charges and currents.
b) provide a single earth for electrical devices.
c) prevent electrolytic corrosion between mating surfaces of similar metals.
d) isolate all components electrically and thus make the static potential constant.

21.2.2.1 (763)
The most widely used electrical frequency in aircraft is :
a) 400 Hz.
b) 200 Hz.
c) 50 Hz.
d) 60 Hz.

21.2.2.1 (764)
The advantages of alternating current on board an aircraft are:1. simple connection2. high starting torque3. flexibility in use4. lighter weight of equipment5. easy to convert into direct current6. easy maintenance of machinesThe combination of correct statements is:
a) 3, 4, 5, 6
b) 1, 2, 3, 4, 5, 6
c) 1, 2, 3, 5, 6
d) 1, 4, 6

21.2.2.1 (765)
If the frequency of the supply in a series capacitive circuit is increased, the current flowing in the circuit will :
a) increase.
b) be zero.
c) decrease.
d) remain the same.

21.2.2.2 (766)
When the AC generators are connected in parallel, the reactive loads are balanced by means of the:
a) energizing current.
b) frequency.
c) voltage.
d) torque of the Constant Speed Drive (CSD).

21.2.2.2 (767)
The main purpose of a Constant Speed Drive unit is to:
a) maintain a constant frequency.
b) take part in the balancing of reactive loads.
c) mechanically protect the alternator drive shaft during coupling.
d) take part in the voltage regulation.

21.2.2.2 (768)
The Auxiliary Power Unit (APU) has its own AC generator which:
a) supplies the aircraft with three-phase 115-200 V, 400 Hz AC.
b) is driven at constant speed throught a Constant Speed Drive (CSD), in the same way as the main AC generator.
c) is excited by its Generator Control Unit (GCU) as soon as the APU starts up.
d) must have the same characteristics as the main AC generator so that it can be easily coupled with the latter.

21.2.2.2 (769)
In flight, if the constant speed drive (CSD) temperature indicator is in the red arc the:
a) pilot must disconnect it, and the generator is not available for the rest of flight.
b) pilot can disconnect it to allow it to cool and use it again.
c) pilot has to throttle back.
d) pilot must disconnect it and manually control the alternator.

21.2.2.2 (770)
As regards the Generator Contol Unit (GCU) of an AC generator, it can be said that:1. The GCU controls the AC generator voltage2. Modern GCUs are provided with a permanent indication to record the failure3. All the commands originating from the control panel are applied via the GCU, except dog clutch release4. The Auxiliary Power Unit (APU) provides the excitation of the AC generator as soon as the APU starts upThe combination regrouping all the correct statements is :
a) 2, 3
b) 3, 4
c) 2, 4
d) 1, 3

21.2.2.2 (771)
On starting, in a brushless AC generator with no commutator rings, the generator is activated by:
a) a set of permanent magnets.
b) the main field winding.
c) the stabilizer winding jointly with the voltage regulator.
d) the auxiliary winding.

21.2.2.2 (772)
A CSD of an AC generator may be disconnected in flight. The primary reason(s) for disconnection are :
a) low oil pressure and/or high oil temperature of the generator drive.
b) excessive variation of voltage and kVAR.
c) illumination of the CSD disconnect warning light.
d) slight variation about the normal operating frequency.

21.2.2.2 (773)
A CSD unit which has been disconnected in flight :
a) may be reset on the ground only, after engine shut-down.
b) may be reset in flight using the reset mechanism.
c) automatically resets in flight providing engine rpm is below a given value.
d) automatically resets at engine shut-down.

21.2.2.2 (774)
The moving part in an AC generator is usually referred to as the :
a) rotor.
b) stator.
c) oscillator.
d) slip ring.

21.2.2.2 (775)
The frequency of an AC generator is dependent upon the :
a) number of pairs of poles and the speed of the rotor.
b) number of individual poles and the field strength.
c) field strength and the speed of the rotor.
d) number of individual poles only.

21.2.2.2 (776)
The function of a constant speed drive (CSD) in an AC generating system is to :
a) drive the generator at a constant speed.
b) vary generator rpm in order to compensate for various AC loads.
c) directly maintain a constant proportion between the rpm of an engine and a generator.
d) vary the engine rpm (within limits) to compensate for various AC loads.

21.2.2.2 (777)
If two constant frequency AC generators are operating independently, then the phase relationship of each generator:
a) is unimportant.
b) must be synchronised.
c) must be 120° out of phase.
d) must be 240° out of phase.

21.2.2.2 (778)
The purpose of a voltage regulator is to control the output voltage of the :
a) generator at varying loads and speeds.
b) batteries at varying loads.
c) generators at varying speeds and the batteries at varying loads.
d) output of the TRU.

21.2.2.2 (779)
A 3 phase AC generator has 3 separate stator windings spaced at :
a) 120°.
b) 60°.
c) 45°.
d) 90°.

21.2.2.2 (780)
On the flight deck, an oil operated CSD unit is normally provided with means of monitoring the:
a) oil over-temperature and low oil pressure.
b) oil temperature and synchronous speed.
c) output speed and oil pressure.
d) low oil temperature and low oil quantity.

21.2.2.2 (781)
An AC generator driven by a CSD unit :
a) requires a voltage controller to maintain constant voltage under load.
b) does not need a voltage controller since the CSD will ensure constant voltage.
c) does not need a voltage controller since an AC generator voltage cannot alter under load.
d) requires a voltage controller to maintain constant frequency.

21.2.2.2 (782)
Assuming a CSD fault is indicated, the CSD should be disconnected :
a) during engine operation only.
b) at flight idle engine rpm.
c) in accordance with the regulated voltage level of the AC generator.
d) on the ground only.

21.2.2.2 (783)
The measured output power components of a constant frequency AC system are :
a) kVA and kVAR.
b) volts and amperes.
c) volts and kilowatts.
d) amperes and kilowatts.

21.2.2.2 (784)
""Frequency wild"" in relation to a AC generation system means the generator :
a) output frequency varies with engine speed.
b) output frequency is too high.
c) voltage regulator is out of adjustment.
d) output frequency is too low.

21.2.2.2 (785)
The function of a CSD in an AC generating system is to:
a) drive the generator at a constant speed.
b) vary the engine rpm (within limits) to compensate for various AC loads.
c) vary generator rpm in order to compensate for various AC loads.
d) directly maintain a constant proportion between the rpm of engine and generator.

21.2.2.2 (786)
The frequency of an AC generator is dependent on the :
a) number of pairs of poles and the speed of the moving part.
b) number of individual poles and the field strength.
c) field strength and the speed of the moving part.
d) number of individual poles only.

21.2.2.2 (787)
A Constant Speed Drive aims at ensuring
a) that the electric generator produces a constant frequency.
b) that the starter-motor maintains a constant RPM not withstanding the acceleration of the engine.
c) that the CSD remains at a constant RPM not withstanding the generator RPM
d) equal AC voltage from all generators.

21.2.2.3 (788)
A thermal circuit breaker:
a) protects the system in the event of overheating, even without exceeding the maximum permissible current.
b) is a protection system with a quick break capacity of about one hundredth of a second.
c) forbids any overcurrent.
d) can be reset without any danger even if the fault remains.

21.2.2.3 (789)
In an aircraft electrical system where AC generators are not paralleled mounted, the changeover relay allows :
a) power supply to the faulty AC generators busbar.
b) connection of the AC generator to its distribution busbar.
c) connection of the ground power truck to its distribution busbar.
d) connection of the Auxiliary Power Unit (APU) to its main busbar.

21.2.2.3 (790)
Pulling the fire shutoff handle causes a number of devices to disconnect. In respect of the AC generator it can be said that the:
a) exciter control relay and the generator breaker open.
b) exciter control relay opens.
c) generator breaker opens.
d) exciter control relay, the generator breaker and the tie breaker open.

21.2.2.3 (791)
As regards three-phase AC generators, the following conditions must be met for paralleling AC generators:1. Equal voltage2. Equal current3. Equal frequencies4. Same phase rotation5. Voltages of same phaseThe combination regrouping all the correct statements is :
a) 1, 3, 4, 5
b) 1, 2, 3, 4
c) 1, 3, 5
d) 1, 4, 5

21.2.2.3 (792)
A magnetic circuit-breaker is:
a) a protection system that has a quick tripping response.
b) permits an overcurrent limited in time.
c) can be reset without any danger even when fault remains.
d) is a system with a slow response time.

21.2.2.3 (793)
On detection of a persistent overvoltage fault on an AC generator connected to the

aircraft AC busbars, the on-board protection device opens:
a) the exciter breaker and the generator breaker.
b) the exciter breaker, the generator breaker and tie breaker.
c) The generator breaker and tie breaker.
d) The generator breaker.

21.2.2.3 (794)
When a persistent top excitation limit fault on an AC generator connected to the mains with another AC generator, the overexcitation protection device opens:
a) the exciter breaker, the generator breaker and the tie breaker.
b) the tie breaker.
c) the exciter breaker and the generator breaker.
d) the generator breaker.

21.2.2.3 (795)
When a persistent overexcitation fault is detected on only one AC generator, the protection device opens the :
a) exciter breaker and generator breaker.
b) exciter breaker, generator breaker and tie breaker.
c) tie breaker.
d) generator breaker and tie breaker.

21.2.2.3 (796)
When an underspeed fault is detected on an AC generator connected to the aircraft AC busbar, the protection device opens the:
a) generator breaker.
b) exciter breaker.
c) exciter breaker and generator breaker.
d) exciter breaker, generator breaker and tie breaker.

21.2.2.3 (797)
The services connected to a supply bus-bar are normally in:
a) parallel, so that isolating individual loads decreases the bus-bar current consumption.
b) series, so that isolating one load increases the bus-bar current consumption.
c) parallel, so that isolation of loads decreases the bus-bar voltage.
d) series, so that isolation of loads increases the bus-bar voltage.

21.2.2.3 (798)
To ensure correct load sharing between AC generators operating in parallel :
a) both real an reactive loads must be matched.
b) the matching of loads is unimportant.
c) only reactive loads need to be matched.
d) only real loads need to be matched.

21.2.2.3 (799)
When operating two AC generators unparalleled, the phase relationship of each generator:
a) is unimportant.
b) must be synchronous.
c) must be in opposition.
d) must be 90° out of synchronisation.

21.2.2.3 (800)
When AC generators are operated in paralllel, they must be of the same:
a) voltage and frequency.
b) amperage and kVAR.
c) voltage and amperage.
d) frequency and amperage.

21.2.2.3 (801)
Real load sharing in a parallel AC system is achieved by :
a) automatic adjustment of the torque on each generator rotor via the CSD unit.
b) controlling the generator field current.
c) carefully selecting the number of loads on the bus-bars at any one time.
d) monitoring the kVAR of each generator/alternator.

21.2.2.3 (802)
Real load sharing in a parallel AC system is achieved by :
a) adjusting the torque on each generator rotor via the CSD unit.
b) carefully secting the number of loads on the bus-bars at any one time.
c) controlling the generator field current.
d) monitoring the kVAR of each generator/alternator.

21.2.2.3 (803)
Load shedding means ..
a) Temporarily or permanent switching off of certain electric users to avoid overload of electric generators
b) To leave behind extra cargo if the centre of gravity moves outside limits
c) Reduction of airloads on the flaps by means of the flap load relief value
d) A procedure used in control systems to reduce the stick forces

21.2.2.5 (804)
The speed of an asynchronous four-pole motor fed at a frequency of 400 Hertz is:
a) 12000 revolutions per minute.
b) 6000 revolutions per minute.
c) 800 revolutions per minute.
d) 1600 revolutions per minute.

21.2.2.6 (805)
In an aeroplane utilising a constant frequency AC power supply, DC power is obtained from a :
a) Transformer Rectifier Unit.
b) static inverter.
c) 3 phase current transformer unit.
d) rotary converter.

21.2.2.6 (806)
On an aeroplane utilising AC as primary power supplies, the batteries are charged in flight from :

a) a Transformer Rectifier Unit.
b) a static inverter.
c) a DC transformer and rectifier.
d) the AC bus via current limiters.

21.2.4.0 (807)
In computer technology, an output peripheral is a:
a) screen unit
b) keyboard
c) hard disk drive
d) diskette drive

21.2.4.0 (808)
In computer technology, an input peripheral is a:
a) keyboard
b) screen unit
c) hard disk drive
d) diskette drive

21.2.4.0 (809)
In computer technology, a storage peripheral is a:
a) hard disk drive
b) printer
c) key board
d) screen unit

21.2.4.0 (810)
In computer technology, an EPROM is:1. a read-only memory2. a write memory3. erases its content when power supply is cut off4. keeps its content when power supply is cut offThe combination regrouping all the correct statements is:
a) 1,4
b) 1,3
c) 2,3
d) 2,4

21.2.4.2 (811)
(For this question use annex 021- 6660A)The logic symbol shown represents (assuming positive logic) :
a) an INVERT or NOT gate.
b) a NAND gate.
c) a NOR gate.
d) an EXCLUSIVE gate.

21.2.4.2 (812)
Because of the input/output relationship of an AND gate, it is often referred to as the :
a) ""all or nothing"" gate.
b) ""any or all"" gate.
c) ""state indicator"" gate.
d) ""inhibited"" or ""negated"" gate.

21.2.4.2 (813)
The function of a NOT logic gate within a circuit is to :
a) invert the input signal such that the output is always of the opposite state.
b) ensure the input signal is AC only.
c) ensure the input signal is DC only.
d) ensure the output signal is of the same state as the input signal.

21.2.4.3 (814)
Because of the input/output relationship of an OR gate, it is often referred to as the :
a) ""any or all"" gate.
b) ""inhibited"" or ""negated"" gate.
c) ""state indicator"" gate.
d) ""all or nothing"" gate.

21.2.5.1 (815)
The wavelength of a radio transmitted on frequency 121.95 MHz is:
a) 2.46 m
b) 24.60 cm
c) 2.46 cm
d) 24.60 m

21.2.5.1 (816)
For weather radar, the frequency 9375 MHz in X Band is preferable to C Band because:
a) It better detects clouds contour and range is greater with the same transmission power.
b) Its penetration power is higher.
c) It is not absorbed by heavy precipitations.
d) It allows greater scanning rates.

21.2.5.1 (817)
The wavelength of a non-directional beacon (NDB) at a frequency of 300 kHz is:
a) 1000 metres.
b) 100 metres.
c) 10 metres.
d) 1 metre.

21.2.5.1 (818)
The minimum airborne equipment required for operation of a the VHF direction finder is a:
a) VHF transmitter-receiver operating in the 118 MHz to 136 MHz range.
b) VHF compass operating in the 200 kHz to 1750 kHz range.
c) VHF receiver operating in the 118 MHz to 136 MHz range.
d) cathode-ray tube.

21.2.5.1 (819)
The secondary Surveillance Radar (SSR) uses the following wavelengths:
a) decimetric.
b) centimetric.

c) hectometric.
d) myriametric.

21.2.5.1 (820)
The airborne weather radar uses the following wavelengths:
a) centimetric.
b) metric.
c) hectometric.
d) myriametric.

21.2.5.1 (821)
The VHF Omnirange (VOR) uses the following wavelengths:
a) metric.
b) hectometric.
c) decimetric.
d) centimetric.

21.2.5.1 (822)
The Instrument Landing System (ILS) uses the following wavelengths:
a) metric.
b) hectometric.
c) decimetric.
d) centimetric.

21.2.5.1 (823)
The Distance Measuring Equipment (DME) uses the following wavelengths:
a) decimetric.
b) hectometric.
c) metric.
d) centimetric.

21.2.5.1 (824)
The Fan Markers uses the following wavelengths:
a) metric.
b) centimetric.
c) hectometric.
d) myriametric.

21.2.5.1 (825)
The VHF direction finder uses the following wavelengths:
a) metric.
b) hectometric.
c) decimetric.
d) centimetric.

21.2.5.1 (826)
The Microwave Landing System (MLS) uses the following wavelengths:
a) centimetric.
b) metric.
c) hectometric.
d) myriametric.

21.2.5.1 (827)
The high Altitude Radio Altimeter uses the following wavelengths:
a) decimetric.
b) metric.
c) hectometric.
d) myriametric.

21.2.5.1 (828)
The Low Altitude Radio Altimeter uses the following wavelengths:
a) centimetric.
b) myriametric.
c) decimetric.
d) metric.

21.2.5.1 (829)
The Automatic Direction Finder uses the following wavelengths:
a) hectometric or kilometric.
b) metric.
c) decimetric.
d) centimetric.

21.2.5.1 (830)
In the response curve of an amplifier, the bandwidth is:
a) The frequency band corresponding to maximum gain less 3 decibels.
b) The frequency band corresponding to maximum gain.
c) The frequency band corresponding to maximum gain less 20 decibels.
d) The frequency band corresponding to maximum gain, increased by 10 kHz at each end.

21.2.5.3 (831)
In aviation, the reflection on ionosphere layers phenomenon is used in the following frequencies:
a) HF
b) VHF
c) UHF
d) VLF

21.2.5.3 (832)
Skip distance is the:
a) range from the transmitter to the first sky wave
b) highest critical frequency distance
c) wavelength distance of a certain frequency
d) thickness of the ionosphere

21.2.5.3 (833)
A radio signal looses strength as range from the transmitter increases, this is called :
a) attenuation

b) refraction
c) propagation
d) ducting

21.2.5.3 (834)
The skip zone of HF-transmission will increase when the following change in circumstance occurs :
a) Higher frequency and higher position of the reflecting ionospheric layer
b) Lower frequency ang higher position of the reflecting ionospheric layer
c) Higher frequency and lower position of the reflecting ionospheric layer
d) Lower frequency and lower position of the reflecting ionospheric layer

21.2.5.3 (835)
In the propagation of MF waves, the phenomenon of FADING is particularly found :
a) at night, due to the combination of the sky and ground waves.
b) by day, due to the combination of sky and ground waves.
c) at night and when raining.
d) by day and when raining.

21.3.1.1 (836)
The positions of the intake and exhaust valve at the end of the power stroke are :
a) intake valve closed and exhaust valve open.
b) both valves open.
c) both valves closed.
d) exhaust valve closed and intake valve open.

21.3.1.1 (837)
The useful work area in an ideal Otto engine indicator diagram is enclosed by the following gas state change lines
a) 2 adiabatic and 2 isochoric lines.
b) 2 adiabatic and 1 isothermic lines.
c) 2 adiabatic and 2 isobaric lines.
d) 2 adiabatic, 1 isochoric and 1 isobaric lines.

21.3.1.1 (838)
The correct formula to calculate the multi-cylinder engine displacement is :
a) piston area * piston stroke * number of cylinders
b) piston area * piston stroke
c) cylinder volume * number of cylinders
d) cylinder length * cylinder diameter

21.3.1.1 (839)
In most cases aeroplane piston engines are short stroke engines. This permits a :
a) lighter construction.
b) lower fuel consumption.
c) better piston cooling.
d) cheaper construction

21.3.1.1 (840)
The working cycle of a four-stroke engine is :
a) induction, compression, power, exhaust.
b) induction, power, compression, exhaust.
c) compression induction, power, exhaust.
d) induction, compression, expansion, power.

21.3.1.1 (841)
The crank assembly consists of
a) crankshaft, connecting rods and pistons.
b) propeller, crankshaft, pistons and connecting rods.
c) Crankcase, crankshaft, connecting rods and pistons.
d) crankshaft, camshaft, valves, valve springs and push rods.

21.3.1.1 (842)
The ignition occurs in each cylinder of an four-stroke engine (TDC = Top Dead Center)
a) before TDC at each second crankshaft revolution.
b) before TDC at each crankshaft revolution.
c) behind TDC at each crankshaft revolution.
d) behind TDC at each second crankshaft revolution.

21.3.1.1 (843)
The power output of a piston engine can be calculated by :
a) Torque times RPM.
b) Work times velocity.
c) Force times distance.
d) Pressure times arm.

21.3.1.1 (844)
The power of a piston engine which will be measured by using a friction brake is :
a) Brake horse power.
b) Friction horse power.
c) Heat loss power.
d) Indicated horse power.

21.3.1.1 (845)
The torque of an aeroplane engine can be measured at the:
a) gear box which is located between the engine and the propeller.
b) propeller blades.
c) accessory gear box.
d) camshaft.

21.3.1.1 (846)
On four-stroke piston engines, the theoretical valve and ignition settings are readjusted in order to increase the:
a) overall efficiency
b) compression ratio
c) piston displacement
d) engine r.p.m.

21.3.1.1 (847)
In a four-stroke piston engine, the only ""driving"" stroke is :
a) firing-expansion
b) intake
c) compression
d) exhaust

21.3.1.1 (848)
A piston engine compression ratio is the ratio of the :
a) total volume to the clearance volume.
b) clearance volume to the swept volume.
c) total volume to the swept volume.
d) swept volume to the clearance volume.

21.3.1.1 (849)
The compression ratio of a piston engine is the ratio of the:
a) volume of the cylinder with the piston at bottom dead centre to that with the piston at top dead centre.
b) diameter of the bore to the piston stroke.
c) area of the piston to the cylinder volume.
d) weight of the air induced to its weight after compression.

21.3.1.1 (850)
The part of a piston engine that transforms reciprocating movement into rotary motion is termed the :
a) crankshaft
b) piston
c) camshaft
d) reduction gear

21.3.1.2 (851)
The reading on the oil pressure gauge is the:
a) pressure of the oil on the outlet side of the pressure pump.
b) difference between the pressure pump pressure and the scavenge pump pressure.
c) pressure in the oil tank reservoir.
d) pressure of the oil on the inlet side of the pressure pump.

21.3.1.2 (852)
For a given type of oil, the oil viscosity depends on the:
a) oil temperature.
b) outside pressure.
c) oil pressure.
d) quantity of oil.

21.3.1.2 (853)
For internal cooling,reciprocating engines are especially dependent on:
a) the circulation of lubricating oil
b) a rich fuel/air mixture
c) a properly functioning thermostat
d) a lean fuel/air mixture

21.3.1.2 (854)
In addition to the fire hazard introduced, excessive priming should be avoided because :
a) it washes the lubricant of cylinder walls
b) it fouls the spark plugs
c) it drains the carburettor float chamber
d) the gasoline dilutes the oil and necessitates changing oil

21.3.1.2 (855)
The oil system for a piston engine incorporates an oil cooler that is fitted :
a) in the return line to the oil tank after the oil has passed through the scavenge pump
b) between the oil tank and the pressure pump
c) after the pressure pump but before the oil passes through the engine
d) after the oil has passed through the engine and before it enters the sump

21.3.1.2 (856)
Low oil pressure is sometimes the result of a
a) worn oil pump
b) too large oil pump
c) restricted oil passage
d) too small scavenger pump.

21.3.1.4 (857)
The purpose of a distributor in an ignition system is to distribute:
a) secondary current to the sparking plugs.
b) primary current to the condenser.
c) secondary current to the condenser.
d) primary current to the sparking plugs.

21.3.1.4 (858)
The very rapid magnetic field changes (flux) around the primary coil in a magneto are accomplished by the:
a) contact breaker points opening.
b) distributor arm aligning with one of the high tension segments.
c) contact breaker points closing.
d) rotor turning past the position of maximum flux in the armature.

21.3.1.4 (859)
If the ground wire between the magnetos and the ignition switch becomes disconnected the most noticeable result will be that:
a) the engine cannot be shut down by turning the ignition switch to the ""OFF"" position
b) a still operating engine will run down
c) the engine cannot be started with the ignition switch in the ""ON"" position
d) the power developed by the engine will be strongly reduced

21.3.1.4 (860)
The purpose of an ignition switch is to :
a) control the primary circuit of the magneto
b) connect the secondary coil to the distributor

c) connect the battery to the magneto
d) connect the contact breaker and condenser in series with the primary coil

21.3.1.4 (861)
Under normal running conditions a magneto draws primary current :
a) from a self-contained electro-magnetic induction system.
b) from the booster coil.
c) directly from the aircraft batteries.
d) from the aircraft batteries via an inverter.

21.3.1.4 (862)
Ignition systems of piston engines are :
a) independant from the electrical system of the aircraft.
b) dependant on the battery.
c) dependant on the DC-Generator.
d) dependant on the AC-Generator.

21.3.1.4 (863)
Prolonged running at low rpm may have an adverse effect on the efficiency of the:
a) sparking plugs.
b) carburettor.
c) oil pump.
d) fuel filter.

21.3.1.4 (864)
An aircraft magneto is switched off by
a) grounding the primary circuit
b) opening the primary circuit
c) opening the secondary circuit
d) grounding the secondary circuit.

21.3.1.4 (865)
An impulse magneto coupling
a) gives a retarded spark at starting
b) reduces magneto speed during engine warm-up
c) advances ignition timing and gives a hotter spark at starting
d) gives an automatic spark increase during high speed operation.

21.3.1.4 (866)
If an engine fails to stop with the magneto switch in OFF position, the cause may be :
a) excessive carbon formation in cylinder head.
b) switch wire grounded
c) defective condenser
d) fouled spark plugs

21.3.1.4 (867)
If the ground wire between the magneto and the ignition switch becomes disconnected, the most noticeable result will be that the engine
a) cannot be shut down by turning the switch to the OFF position.
b) will not operate at the left magneto
c) will not operate at the right magneto
d) cannot be started with the switch in the ON position

21.3.1.4 (868)
An impulse coupling used on a magneto for a piston engine is for
a) providing a retarded spark for engine starting.
b) advancing ignition timing
c) quick removal and installation
d) absorbing starting loads

21.3.1.4 (869)
In a piston engine, magnetos are used to produce the spark which ignites the fuel/ air mixture. The operating principle of magnetos consists in :
a) breaking the primary current in order to induce a low amp high volt current which is distributed to the spark plugs.
b) obtaining a high amp low volt current in order to generate the spark.
c) accumulating in a condenser a low volt current from the battery, reconstitute it as high voltage current at the moment the spark is generated.
d) creating a brief high intensity magnetic field which will be sent through the distributor at the appropriate time.

21.3.1.4 (870)
When the magneto selector switch is set to ""OFF"" position, the piston engine continues to run normally.The most probable cause of this failure is that:
a) On a magneto, a grounding wire is broken.
b) There is a carbon deposit on the spark plugs electrodes.
c) A wire from the magneto is in contact with a metallic part of the engine.
d) There are local hot points in the engine (probably due to overheating of the cylinder heads).

21.3.1.5 (871)
On modern carburettors, the variations of mixture ratios are obtained by the adjustment of :
a) fuel flow.
b) air flow.
c) fuel flow and air flow.
d) fuel flow, air flow and temperature.

21.3.1.5 (872)
A fuel strainer when fitted to a carburettor will be positioned :
a) upstream of the needle valve.
b) between the needle valve and the metering jet.
c) between the metering jet and the discharge nozzle.
d) downstream of th discharge nozzle.

21.3.1.5 (873)
The purpose of the venturi in a carburettor is to:
a) create the depression necessary to cause fuel to flow through the carburettor jets.
b) prevent enrichment of the mixture due to high air velocity through the carburettor.

c) ensure complete atomisation of the fuel before entering the induction system.
d) create a rise in pressure at the throat before the mixture enters the induction system.

21.3.1.5 (874)
In which sections of the carburettor would icing most likely occur?
a) venturi and the throttle valve
b) float chamber and fuel inlet filter
c) accelerator pump and main metering jet
d) main air bleed and main discharge nozzle

21.3.1.5 (875)
The operating principle of float-type carburettors is based on the:
a) difference in air pressure at the venturi throat and the air inlet
b) automatic metering of air at the venturi as the aircraft gains altitude
c) increase in air velocity in the throat of a venturi causing an increase in air pressure
d) measurement of the fuel flow into the induction system

21.3.1.5 (876)
In an engine equipped with a float-type carburettor, the low temperature that causes carburettor ice is normally the result of:
a) vaporization of fuel and expansion of the air in the carburettor
b) freezing temperature of the air entering the carburettor
c) compression of air at the carburettor venturi
d) low volatility of aviation fuel

21.3.1.5 (877)
Which statement is true concerning the effect of the application of carburettor heat?
a) it reduces the density of air entering the carburettor, thus enriching the fuel/air mixture
b) it reduces the volume of air entering the carburettor,thus leaning the fuel/air mixture
c) it reduces the density of air entering the carburettor, thus leaning the fuel/air mixture
d) it reduces the volume of air entering the carburettor,thus enriching the fuel/air mixture

21.3.1.5 (878)
Vapour lock is :
a) vaporizing of fuel prior to reaching the carburettor
b) the formation of water vapour in a fuel system
c) vaporizing of fuel in the carburettor
d) the inability of a fuel to vaporize in the carburettor

21.3.1.5 (879)
With respect to a piston engined aircraft, ice in the carburettor :
a) may form at OAT's higher than +10°C.
b) will only form at OAT's below +10°C.
c) will only form at outside air temperatures (OAT's) below the freezing point of water.
d) will only form at OAT's below the freezing point of fuel.

21.3.1.5 (880)
To ensure that the fuel flow is kept directly proportional to the volume of air flowing through the choke, thus preventing the main jet supplying excessive fuel as engine speed is increased, a carburettor is fitted with :
a) a diffuser
b) a power jet
c) an accelerator pump
d) a mixture control

21.3.1.5 (881)
Spark timing is related to engine speed in the way that the:
a) faster the engine functions, the more the spark is advanced
b) slower the engine functions, the more the spark is advanced
c) faster the engine functions, the further past TDC the spark occurs
d) faster the engine functions, the more retarded the spark is.

21.3.1.5 (882)
""Vapor lock"" is the phenomenon by which:
a) heat produces vapour plugs in the fuel line.
b) water vapour plugs are formed in the intake fuel line following the condensation of water in fuel tanks which have not been drained for sometime.
c) abrupt and abnormal enrichment of the fuel/air mixture following an inappropriate use of carburettor heat.
d) burnt gas plugs forming and remaining in the exhaust manifold following an overheat and thereby disturbing the exhaust.

21.3.1.6 (883)
The power of a piston engine decreases during climb with a constant power lever setting, because of the decreasing :
a) air density.
b) engine temperature.
c) humidity.
d) temperature.

21.3.1.6 (884)
The conditions under which you obtain the highest engine power are :
a) cold and dry air at high pressure.
b) warm and humid air at low pressure.
c) cold and humid air at high pressure.
d) warm and dry air at high pressure.

21.3.1.6 (885)
The power output of a normally aspirated piston engine increases with increasing altitude at constant Manifold Air Pressure (MAP) and RPM because of the :
a) lower back pressure.
b) lower losses during the gas change.
c) lower friction losses.
d) leaner mixture at higher altitudes.

21.3.1.6 (886)
During climb with constant Manifold Air Pressure (MAP) and RPM indication and constant mixture setting, the power output of a piston engine :
a) increases.

b) decreases.
c) only stays constant if the speed control lever is pushed forward.
d) stays constant.

21.3.1.6 (887)
The global output of a piston engine is of:(global output = Thermal energy corresponding to the available shaft/power over the total thermal energy produced).
a) 0.30
b) 0.50
c) 0.75
d) 0.90

21.3.1.7 (888)
A turbocharger system is normally driven by:
a) the exhaust system.
b) an electric motor.
c) an hydraulic motor.
d) an electrically activated hydraulically powered clutch.

21.3.1.7 (889)
A turbocharger consists of a :
a) compressor and turbine mounted on a common shaft.
b) compressor and turbine on individual shafts.
c) compressor driving a turbine via a reduction gear.
d) turbine driving a compressor via a reduction gear.

21.3.1.7 (890)
The air in a piston engine turbo-supercharger centrifugal compressor :
a) enters the eye of the impeller and leaves at a tangent to the periphery.
b) enters via the diffuser and is fed to the impeller at the optimum angle of attack.
c) enters at the periphery and leaves via the eye of the impeller.
d) enters at a tangent to the rotor and leaves via the stator.

21.3.1.7 (891)
In a piston engine, turbocharger boost pressure may be monitored by :
a) a manifold pressure gauge only.
b) a cylinder head temperature gauge (CHT), a manifold pressure gauge, and engine rpm readings.
c) both a CHT gauge and manifold pressure gauge.
d) both engine rpm readings and a manifold pressure gauge.

21.3.1.7 (892)
The primary purpose of a supercharger is to :
a) maintain power at altitude
b) increase quantity of fuel at metering jet
c) provide leaner mixtures at altitudes below 5000 ft
d) provide a richer mixture at high altitudes

21.3.1.7 (893)
The kind of compressor normally used as a supercharger is :
a) a radial compressor.
b) an axial compressor.
c) a hybrid compressor.
d) a piston compressor.

21.3.1.7 (894)
What can be the consequence during a descent with a fully open throttle if the waste gate is seized ?
a) The manifold air pressure (MAP) value may exceed the maximum allowed value.
b) The power of the motor will decrease.
c) The turbine shaft will break.
d) The turbine blades will separate.

21.3.1.7 (895)
One of the advantages of a turbosupercharger is that :
a) it uses the exhaust gas energy which normally is lost.
b) it has a better propulsive efficiency.
c) there is no torsion at the crankshaft.
d) there is no danger of knocking.

21.3.1.8 (896)
The octane rating of a fuel characterises the :
a) the anti-knock capability
b) fuel volatility
c) quantity of heat generated by its combustion
d) fuel electrical conductivity

21.3.1.8 (897)
Fuel stored in aircraft tanks will accumulate moisture. The most practical way to minimize this when an aircraft is used every day or so is to :
a) keep tanks topped off when the aircraft is not in use
b) drain tanks at end of each day's flight
c) use only high octane gasoline
d) keep tank vents plugged and filler cap tight

21.3.1.8 (898)
The octane rating of a fuel and compression ratio of a piston engine have which of the following relations?
a) the higher the octane rating is, the higher the possible compression ratio is
b) the lower the octane rating is, the higher the possible compression ratio is
c) the higher the octane rating is, the lower the possible compression ratio is.
d) compression ratio is independent of the octane rating.

21.3.1.8 (899)
A piston engine may use a fuel of a different grade than the recommended:
a) provided that the grade is higher
b) provided that the grade is lower
c) never
d) provided that it is an aeronautical petrol

21.3.1.9 (900)
A rich mixture setting has to be used during climb segments. This results in a
a) lower cylinder head temperature.
b) higher efficiency.
c) slight loss of power.
d) higher torque.

21.3.1.9 (901)
Max. Exhaust Gas Temperature is theoretically associated with :
a) Mass ratio of 1/15.
b) Cruising mixture setting.
c) Full rich setting.
d) Mixture ratio very close to idle cut-out.

21.3.1.9 (902)
For piston engines, mixture ratio is the ratio between the :
a) mass of fuel and mass of air entering the cylinder.
b) volume of fuel and volume of air entering the cylinder.
c) volume of fuel and volume of air entering the carburettor.
d) mass of fuel and volume of air entering the carburettor.

21.3.1.9 (903)
Specific fuel consumption is defined as the :
a) mass of fuel required to produce unit power for unit time.
b) designed fuel consumption for a given rpm.
c) quantity of fuel required to run the engine for one minute at maximum operating conditions.
d) maximum fuel consumption of the aircraft.

21.3.1.9 (904)
In a piston engine, the purpose of an altitude mixture control is to :
a) correct for variations in the fuel/air ratio due to decreased air density at altitude.
b) prevent a weak cut when the throttle is opened rapidly at altitude.
c) weaken the mixture strength because of reduced exhaust back pressure at altitude.
d) enrich the mixture strength due to decreased air density at altitude.

21.3.1.9 (905)
The mixture control for a carburettor achieves its control by:
a) varying the fuel supply to the main discharge tube.
b) moving the butterfly valve through a separate linkage to the main throttle control.
c) altering the depression on the main discharge tube.
d) varying the air supply to the main discharge tube.

21.3.1.9 (906)
An excessively rich mixture can be detected by :
a) black smoke from exhaust.
b) high cylinder head temperatures
c) white smoke from exhaust.
d) a long purple flame from exhaust.

21.3.1.9 (907)
When leaning the mixture for the most economic cruise fuel flow, excessive leaning will cause :
a) high cylinder head and exhaust gas temperature
b) high engine rpm
c) low cylinder head and exhaust gas temperature
d) high manifold pressure

21.3.1.9 (908)
The main purpose of the mixture control is to:
a) adjust the fuel flow to obtain the proper fuel/air ratio
b) decrease the air supplied to the engine
c) increase the oxygen supplied to the engine
d) decrease oxygen supplied to the engine

21.3.1.9 (909)
Fuel/air ratio is the ratio between the:
a) mass of fuel and mass of air entering the cylinder.
b) volume of fuel and volume of air entering the carburettor.
c) volume of fuel and volume of air entering the cylinder.
d) mass of fuel and mass of air entering the carburettor

21.3.1.9 (910)
Overheating of a piston engine is likely to result from an excessively :
a) weak mixture.
b) rich mixture.
c) low barometric pressure.
d) high barometric pressure.

21.3.1.9 (911)
In a piston engine if the ratio of air to fuel, by weight, is approximately 9:1, the mixture is said to be :
a) rich
b) weak
c) too weak to support combustion
d) normal

21.3.1.9 (912)
For a piston engine, the ideal fuel/air mixture corresponding to a richness of 1 is obtained for a weight ratio of:
a) 1/15 th
b) 1/9 th
c) 1/10th
d) 1/12th

21.3.1.9 (913)
(For this question use appendix)On the attached diagram showing the power output of a piston engine as a function of mixture richness, best economy is at the point marked:
a) 1
b) 2

c) 3
d) 4

21.3.1.9 (914)
The richness of a fuel/air mixture ratio is the :
a) real mixture ratio relative to the theoretical ratio.
b) mass of fuel relative to the volume of air.
c) volume of fuel relative to the volume of air.
d) volume of fuel relative to the mass of the volume of air.

21.3.1.10 (915)
The feathering pump of a hydraulic variable-pitch propeller:
a) is an electrically driven oil pump, which supplies the propeller with pressure oil, when the engine is inoperative.
b) is intended to control the pitch setting of the propeller during flight in order to obtain a constant speed.
c) controls the propeller, if the speed governor fails.
d) is driven by the engine and supplies pressure oil to the propeller in case of engine problems.

21.3.1.10 (916)
Consider the variable-pitch propeller of a turbo-prop.During deceleration :
a) when braking, the propeller supplies negative thrust and absorbs engine power.
b) at zero power, the propeller thrust is zero and the engine power absorbed is nil.
c) when feathered, the propeller produces thrust and absorbs no engine power.
d) with propeller windmilling, the thrust is zero and the propeller supplies engine power.

21.3.1.10 (917)
The pitch angle of a constant-speed propeller
a) increases with increasing true air speed.
b) only varies with engine RPM.
c) decreases with increasing true air speed.
d) is independent of the true air speed.

21.3.1.10 (918)
A propeller blade is twisted, so as to
a) keep the local Angle of Attack constant along the blade.
b) avoid the appearance of sonic phenomena.
c) decrease the blade tangential velocity from the blade root to the tip.
d) allow a higher mechanical stress.

21.3.1.10 (919)
A pilot normally uses the propeller autofeather system during :
a) Take-off and landing.
b) Cruise.
c) Take-off.
d) Landing.

21.3.1.10 (920)
When increasing true airspeed with a constant engine RPM, the angle of attack of a fixed pitch propeller :
a) reduces.
b) increases.
c) stays constant.
d) stays constant because it only varies with engine RPM.

21.3.1.10 (921)
When TAS increases, the pitch angle of a constant speed propeller (RPM and MAP levers are not moved) :
a) increases.
b) reduces.
c) first reduces and after a short time increases to its previous value.
d) stays constant.

21.3.1.10 (922)
The main advantage of a constant speed propeller as compared to a fixed pitch propeller is a :
a) higher efficiency in all operating ranges.
b) constant efficiency in all operating ranges.
c) lower propeller blade stress.
d) higher efficiency in cruising range.

21.3.1.10 (923)
To unfeather a propeller during flight you have to :
a) use the electric unfeathering pump.
b) manually release the blade latch.
c) gain speed for aerodynamic unfeathering.
d) gain speed so as to use the engine unfeathering pump.

21.3.1.10 (924)
In case of engine failure during flight the blades of the constant speed propeller in a single engine aeroplane, not fitted with feathering system
a) move in the lowest pitch position by the centrifugal force.
b) move in low pitch position by oil pressure created by the windmilling propeller.
c) move in a certain pitch position depending on windmilling RPM.
d) move in the highest pitch position by the aerodynamical force.

21.3.1.10 (925)
For take-off, the correct combination of propeller pitch (1), and propeller lever position (2) at brake release is :
a) (1) low (2) forward.
b) (1) low (2) aft.
c) (1) high (2) aft.
d) (1) high (2) forward.

21.3.1.10 (926)
On a normally aspirated aero-engine fitted with a fixed pitch propeller :
a) manifold pressure decreases as the aircraft climbs at a fixed throttle setting.
b) the propeller setting is constant at all indicated airspeeds.
c) in level flight, manifold pressure will remain constant when the rpm is increased by opening

the throttle.
d) in a descent at a fixed throttle setting manifold pressure will always remain constant.

21.3.1.10 (927)
An asymmetric loading (p-factor) on the propeller exists ..
a) If the aeroplane has a large angle of attack.
b) If there is an unbalanced propeller.
c) Only for counterrotating propeller
d) Only if the 'constant speed propeller' mechanism is broken.

21.3.1.10 (928)
In twin-engine aeroplanes with right turning propellers
a) the left engine is the critical motor.
b) the left engine produces a higher yaw moment if the right engine fails than vice versa.
c) the 'minimum control speed' is determined by the failure of the right engine.
d) the right engine is the critical motor.

21.3.1.10 (929)
In general, in twin-engine aeroplanes with 'constant speed propeller'
a) the oil pressure turns the propeller blades towards smaller pitch angle.
b) the aerodynamic force turns the propeller blades towards higher pitch angle.
c) the spring force turns the propeller blades towards smaller pitch angle.
d) the oil pressure turns the propeller blades towards higher pitch angle.

21.3.1.10 (930)
In modern aircraft, a pilot can actuate the feather system by :
a) pulling the RPM lever backwards.
b) pushing the RPM lever forward.
c) pushing the power lever forward.
d) pulling the power levers backwards.

21.3.1.10 (931)
Fixed-pitch propellers are usually designed for maximum efficiency at :
a) cruising speed
b) idling
c) full throttle
d) take-off

21.3.1.10 (932)
Which of the following qualitative statements about a fixed propeller optimized for cruise condition, is true for the take-off case? The angle of attack of the propeller :
a) blade is relatively high.
b) blade is relatively small.
c) airfoil section is negative.
d) blades reduces to zero.

21.3.1.10 (933)
The 'constant speed propeller' has
a) only above and below the design point a better efficiency than the fixed propeller with the same design speed.
b) in general a worse efficiency than the fixed propeller.
c) only at the design speed a better efficiency than the fixed propeller.
d) its best efficiency during climb.

21.3.1.10 (934)
What will happen to the geometrical pitch angle of a ""constant speed propeller"" if the manifold pressure is increased ?
a) It will increase
b) It will increase and after a short time it will be the same again
c) It will decrease so that the engine can increase
d) It will remain the same

21.3.1.10 (935)
The 'slipstream effect' of a propeller is most prominent at:
a) low airspeeds with high power setting.
b) high airspeeds with low power setting.
c) high airspeeds with high power setting.
d) low airspeeds with low power setting.

21.3.1.10 (936)
The pitch angle of a propeller is the angle between the :
a) reference chord line and the propeller plane of rotation.
b) propeller reference chord line and the relative airflow.
c) propeller reference chord line and the extremity of the propeller.
d) propeller plane of rotation and the relative airflow.

21.3.1.10 (937)
When in flight, a piston engine is stopped and the propeller blade pitch angle is near 90°, the propeller is said to be...
a) feathered.
b) windmilling.
c) transparent.
d) at zero drag.

21.3.1.10 (938)
During a power change on an engine equipped with a constant speed propeller, a wrong combination of manifold pressure and RPM values results in excessive pressures in the cylinders. This is the case when one simultaneously selects a ...
a) high manifold pressure and low RPM.
b) low manifold pressure and high RPM.
c) high manifold pressure and high RPM.
d) low manifold pressure and low RPM.

21.3.1.10 (939)
From the cruise, with all the parameters correctly set, if the altitude is reduced, to maintain the same mixture the fuel flow should:
a) increase
b) decrease
c) remain the same
d) increase or decrease, depending on the engine type

21.3.1.11 (940)
When applying carburettor heating :
a) the mixture becomes richer.
b) a decrease in RPM results from the lean mixture.
c) the mixture becomes leaner.
d) no change occurs in the mixture ratio.

21.3.1.11 (941)
When the pilot moves the mixture lever of a piston engine towards a lean position the :
a) amount of fuel entering the combustion chamber is reduced.
b) volume of air entering the carburettor is reduced.
c) amount of fuel entering the combustion chamber is increased.
d) volume of air entering the carburettor is increased.

21.3.1.11 (942)
When altitude increases without adjustment of the mixture ratio, the piston engine performance is affected because of a :
a) decrease of air density for a constant quantity of fuel.
b) constant air density for a bigger quantity of fuel.
c) increase of air density for smaller quantity of fuel.
d) decrease of air density for a smaller quantity of fuel.

21.3.1.11 (943)
When changing power on engines equipped with constant-speed propeller, engine overload is avoided by :
a) increasing the RPM before increasing the manifold pressure.
b) adjusting Fuel Flow before the manifold pressure.
c) reducing the RPM before reducing the manifold pressure.
d) increasing the manifold pressure before increasing the RPM.

21.3.1.11 (944)
To adjust the mixture ratio of a piston engine when altitude increases, means to:
a) decrease the fuel flow in order to compensate for the decreasing air density.
b) decrease the amount of fuel in the mixture in order to compensate for the increasing air density.
c) increase the amount of fuel in the mixture to compensate for the decreasing air pressure and density.
d) increase the mixture ratio.

21.3.1.11 (945)
The maximum horsepower output which can be obtained from an engine when it is operated at specified rpm and manifold pressure conditons established as safe for continuous operation is termed :
a) rated power.
b) maximum power.
c) take-off power.
d) critical power.

21.3.1.11 (946)
With which instrument(s) do you monitor the power output of an aeroplane fitted with a fixed pitch propeller?
a) RPM indicator.
b) RPM and Fuel Flow indicator.
c) RPM and MAP indicator.
d) RPM and EGT indicator.

21.3.1.11 (947)
An EGT (Exhaust Gas Temperature) indicator for a piston engine is used to :
a) assist the pilot to settle correct mixture.
b) control the cylinder head temperature.
c) control the carburator inlet air flow.
d) control the fuel temperature.

21.3.1.11 (948)
During climb with constant throttle and RPM lever setting (mixture being constant) the :
a) Manifold Air Pressure (MAP) decreases.
b) RPM decreases.
c) Manifold Air Pressure (MAP) increases.
d) RPM increases.

21.3.1.11 (949)
The conditions which can cause knocking are :
a) High manifold pressure and low revolutions per minute.
b) High manifold pressure and high revolutions per minute.
c) Low manifold pressure and high revolutions per minute.
d) Low manifold pressure and high fuel flow.

21.3.1.11 (950)
Which of the following factors would be likely to increase the possibility of detonation occurring within a piston engine ?
a) using too lean a fuel/air mixture ratio
b) the use of a fuel with a high octane rating as compared to the use of one with a low octane rating
c) using an engine with a low compression ratio
d) slightly retarding the ignition timing

21.3.1.11 (951)
On a a normally aspirated engine (non turbo-charged), the manifold pressure gauge always indicates...
a) a lower value than atmospheric pressure when the engine is running.
b) a greater value than atmospheric pressure when the engine is running.
c) zero on the ground when the engine is stopped.
d) a value equal to the QFE when the engine is at full power on the ground.

21.3.1.11 (952)
Spark plug fouling is more likely to happen if :
a) the aircraft climbs without mixture adjustment.
b) the aircraft descends without a mixture adjustment.
c) power is increased too abruptly.
d) the engine runs at the authorized maximum continuous power for too long.

21.3.1.12 (953)
Pre-ignition refers to the condition that may arise when :
a) the mixture is ignited by abnormal conditions within the cylinder before the spark occurs at the plug
b) the mixture is ignited before the piston has reached top dead centre.
c) a rich mixture is ignited by the sparking plugs.
d) the sparking plug ignites the mixture too early.

21.3.1.12 (954)
With a piston engine, when detonation is recognised, you:
a) Reduce manifold pressure and enrich the mixture
b) Reduce manifold pressure and lean the mixture
c) Increase manifold pressure and enrich the mixture
d) Increase manifold pressure and lean the mixture

21.3.2.1 (955)
In a turbo-jet, the purpose of the turbine is to ...
a) drive the compressor by using part of the energy from the exhaust gases
b) clear the burnt gases, the expansion of which provide the thrust
c) compress the air in order to provide a better charge of the combustion chamber
d) drive devices like pumps, regulator, generator.

21.3.2.2 (956)
(Use the appendix to answer this question)The gas turbine illustrated is of the following type:
a) free turbine and centrifugal compressor
b) free turbine and axial compressor
c) single shaft turbine and centrifugal compressor
d) single shaft turbine and axial compressor

21.3.3.1 (957)
The purpose of the blow-in-doors at the air inlets is to:
a) provide the engine with additional air at high power settings and low air speeds.
b) provide the engine with additional air at high power settings at cruising speed.
c) feed cooling air to the engine cowling.
d) serve to increase the relative velocity at the first compressor stage.

21.3.3.2 (958)
In a compressor stage of a jet engine, the sequence is:
a) rotor - stator
b) stator - rotor
c) rotor - rotor - stator
d) stator - stator - rotor

21.3.3.2 (959)
In a single spool gas turbine engine, the compressor rpm is :
a) the same as turbine rpm.
b) independent of turbine rpm.
c) greater than turbine rpm.
d) less than turbine rpm.

21.3.3.2 (960)
In the axial flow compressor of a turbo-jet engine, the flow duct is tapered. Its shape is calculated so as to:
a) maintain a constant axial speed in cruising flight.
b) maintain a constant axial speed whatever the engine rating.
c) reduce the axial speed in cruising flight.
d) reduce the axial speed, whatever the engine rating.

21.3.3.2 (961)
The compressor surge effect during acceleration is prevented by the :
a) Fuel Control Unit (F.C.U.).
b) inlet guide vanes.
c) surge bleed valves.
d) variable setting type nozzle guide vanes.

21.3.3.2 (962)
Concerning the centrifugal compressor, the compressor diffuser is a device in which the:
a) pressure rises and velocity falls.
b) pressure rises at a constant velocity.
c) velocity, pressure and temperature rise.
d) velocity rises and pressure falls.

21.3.3.2 (963)
The fan in a high by-pass ratio turbo-jet engine produces:
a) the greater part of the thrust.
b) half the thrust.
c) the lesser part of the thrust.
d) none of the thrust.

21.3.3.2 (964)
In a gas turbine engine, compressor blades, which are not rigidly fixed in position when the engine is stationary, take up a rigid position when the engine is running due to :
a) the resultant of aerodynamic and centrifugal forces.
b) oil pressure.
c) thermal expansion.
d) blade creep.

21.3.3.2 (965)
The primary purpose of the bleed valves fitted to axial flow compressors is to :
a) reduce the likelihood of compressor stall.
b) control the acceleration time of the engine.
c) spill compressor air should the engine overspeed thus controlling the speed.
d) enable an external air supply to spin up the compressor for engine starting.

21.3.3.2 (966)
The disadvantages of axial flow compressors compared to centrifugal flow compressors are :1 - expensive to manufacture2 - limited airflow3 - greater vulnerability to foreign object damage4 - limited compression ratioThe combination of correct answers is :

a) 03-Jan
b) 02-Jan
c) 03-Fev
d) 04-Fev

21.3.3.2 (967)
A stage in an axial compressor:
a) is made of a rotor disc followed by a row of stator blades
b) has a compression ratio in the order of 2.1
c) is made of row of stator blades followed by a rotor disc
d) has a compression ration in the order of 0.8

21.3.3.4 (968)
In a gas turbine engine, the maximum gas temperature is attained:
a) within the combustion chamber.
b) across the turbine.
c) in the cooling airflow around the flame tube.
d) at the entry to the exhaust unit.

21.3.3.5 (969)
When the combustion gases pass through a turbine the :
a) pressure drops.
b) pressure rises.
c) velocity decreases.
d) temperature increases.

21.3.3.5 (970)
In the stator of a turbine, the speed V and static pressure Ps vary as follows:
a) V increases, Ps decreases.
b) V decreases, Ps increases.
c) V increases, Ps increases.
d) V decreases, Ps decreases.

21.3.3.5 (971)
An impulse turbine is a turbine in which the expansion takes place:
a) fully in the stator.
b) fully in the rotor.
c) in the stator and in the rotor.
d) in order to produce a degree of jet propulsion < 1/2.

21.3.3.5 (972)
A ""fan"" stage of a ducted-fan turbine engine is driven by:
a) the low pressure turbine.
b) the high pressure compressor through reduction gearing.
c) the high pressure turbine.
d) airflow drawn across it by the high pressure compressor.

21.3.3.5 (973)
In a free turbine engine:
a) there is no mechanical connection between the compressor and the power output shaft.
b) its shaft may be connected to either a compressor or another turbine.
c) the air enters the compressor via the input turbine.
d) the compressor and power output shaft are mechanically connected.

21.3.3.5 (974)
The primary reason for a limitation being imposed on the temperature of gas flow is to :
a) ensure that the maximum acceptable temperature at the turbine blades is not exceeded.
b) prevent damage to the jet pipe from overheating.
c) prevent overheating and subsequent creep of the nozzle guide vanes.
d) ensure that the maximum acceptable temperature within the combustion chamber is not exceeded.

21.3.3.5 (975)
Turbine blade stages may be classed as either ""impulse"" or ""reaction"". In an impulse blade section :
a) the pressure drops across the nozzle guide vanes and remains constant across the rotor blades .
b) the pressure rises across the nozzle guide vanes and remains constant across the rotor blades .
c) the pressure remains constant across the nozzle guide vanes and drops across the rotor blades .
d) the pressure remains constant across the nozzle guide vanes and rises constant across the rotor blades .

21.3.3.7 (976)
For a fan jet engine, the by-pass ratio is the:
a) external airflow mass divided by the internal airflow mass
b) internal airflow mass divided by the external airflow mass
c) internal airflow mass divided by the fuelflow mass
d) fuelflow mass divided by the internal airflow mass

21.3.3.8 (977)
A reverse thrust door warning light on the flight deck instrument panel illuminates when:
a) the reverser doors are unlocked.
b) the reverser doors are locked.
c) reverse has been selected but the doors have remained locked.
d) the reverser doors have moved to the reverse thrust position.

21.3.3.10 (978)
At constant fuel flow, if engine compressor air is bled off for engine anti-icing or a similar system, the turbine temperature:
a) will rise.
b) will be unchanged.
c) may rise or fall depending on which stage of the compressor is used for the bleed and the rpm of the engine at the moment of selection.
d) will fall.

21.3.3.10 (979)
If air is tapped from a gas turbine HP compressor, the effect on the engine pressure ratio (EPR) and the exhaust gas temperature (EGT) is that :
a) EPR decreases and EGT increases.
b) both EPR and EGT decrease.
c) EPR decreases and EGT remains constant.
d) EPR remains constant and EGT increases.

21.3.3.10 (980)
Using compressor bleed air to power systems:
a) decreases aircraft performance
b) has no influence on aircraft performance
c) increases aircraft performance
d) is limited to the phases of take-off and landing

21.3.3.11 (981)
The accessory units driven by the accessory gearbox of a turbo-jet engine are the :1. tacho-generator N12. tacho-generator N23. thrust reverser pneumatic motors4. AC generator and its Constant Speed Unit (CSD)5. oil pumps6. hydraulic pumps7. high pressure fuel pumpsThe combination regrouping all the correct statements is :
a) 1, 4, 5, 6, 7.
b) 2, 3, 4, 5, 6, 7.
c) 2, 4, 5, 6.
d) 4, 5, 6, 7.

21.3.4.1 (982)
The use of igniters is necessary on a turbo-jet:1 - throughout the operating range of the engine2 - for accelerations3 - for ground starts4 - for in-flight relights5 - during turbulence in flight6 - under heavy precipitation or in icing conditionsThe combination which regroups all of the correct statements is :
a) 3 - 4 - 5 - 6
b) 3
c) 2002-03-04
d) 1

21.3.4.2 (983)
For a turbine engine, the term self-sustaining speed relates to the speed at which the engine :
a) will run without any external assistance.
b) is designed to idle after starting.
c) operates most efficiently in the cruise..
d) will enable the generators to supply bus-bar voltage.

21.3.4.2 (984)
An impulse coupling does not function at such speeds above those encountered in starting. Its engaging pawls are prevented from operating at higher speeds by
a) centrifugal force
b) engine oil pressure
c) a coil spring
d) electro-magnetic action of operating magneto.

21.3.4.3 (985)
A ""hung start"" is the failure of an engine to accelerate to its normal idle speed. It may be caused by:
a) an attempt to ignite the fuel before the engine has been accelerated sufficiently by the starter.
b) compressor surging.
c) the starter cutting out early in the starting sequence before the engine has accelerated to the required rpm for ignition.
d) failure of the fuel to ignite in the starting sequence after the engine has been accelerated to the required rpm by the starter.

21.3.4.4 (986)
The pressure usually produced by the Boost Pumps (BP) of the fuel supply system is within the following range:
a) 20 to 50 psi
b) 5 to 10 psi
c) 3000 to 5000 psi
d) 300 to 500 psi

21.3.4.4 (987)
The purpose of the barometric correction in a fuel controller is to:
a) maintain the correct weight fuel to air ratio when the altitude increases.
b) reduce the fuel-to-air ratio when altitude increases.
c) increase the fuel-to-air ratio when altitude increases.
d) maintain a constant fuel metering whatever the altitude.

21.3.4.4 (988)
(For this question use annex 021-4008A)Reference should be made to the fuel sypply system shown in annex.In flight, with center tank empty and APU operating, a fuel unbalance is detected (quantity in tank 1 < quantity in tank 2).Rebalancing of the two tanks is:
a) possible with ""CROSSFEED"" open and tank 1 pumps ""OFF"" and tank 2 pumps ""ON"".
b) impossible without causing the APU stop.
c) possible with ""CROSSFEED"" open and tank 2 pumps ""OFF"".
d) impossible because there is no fuel in center tank.

21.3.4.4 (989)
In a gas turbine engine, the power changes are normally made by controlling the amount of:
a) fuel supplied.
b) air entering the compressor.
c) air leaving the compressor by the opening or closing of bleed valves.
d) air entering the compressor and fuel entering the combustion chambers.

21.3.4.5 (990)
In a fuel system, the oil to fuel heat exchanger allows:
a) jet engine oil cooling through thermal exchange with fuel flowing from tanks.
b) fuel cooling so as to prevent vapour creation likely to unprime nozzles.
c) fuel heating as required whenever fuel filter clogging is detected.
d) automatic fuel heating by the engine oil so as to prevent icing in fuel filter.

21.3.4.5 (991)
The reason for having a low pressure fuel-cooled oil cooler in a recirculatory type oil system is to:
a) cool the oil and heat the fuel.
b) cool the oil only.
c) cool both the oil and the fuel.
d) heat the fuel only.

21.3.4.5 (992)
In very cold weather, the pilot notices during startup, a slightly higher than normal oil pressure.This higher pressure :
a) is normal, if it decreases after startup.
b) is abnormal and requires the engine to be shut down.
c) is abnormal but does not require the engine to be shut down.
d) requires an oil change.

21.3.4.6 (993)
The fuel temperature, at which, under standard conditions, the vapour ignites in contact with a flame and extinguishs immediately, is the:
a) flash point
b) combustion point
c) fire point
d) self ignition point

21.3.4.7 (994)
An engine pressure ratio (EPR) gauge reading normally shows the ratio of:
a) jet pipe pressure to compressor inlet pressure.
b) jet pipe pressure to combustion chamber pressure.
c) combustion chamber pressure to compressor inlet pressure.
d) compressor outlet pressure to compressor inlet pressure.

21.3.4.7 (995)
The thrust of a turbo-jet, at the selection of full power :1 - equals the product of the exhaust gas mass flow and the exhaust gas velocity2 - is obtained by pressure of the exhaust gas on the ambient air3 - is equivalent to zero mechanical power since the aeroplane is not moving4 - is independant of the outside air temperatureThe combination which regroups all of the correct statements is :
a) 03-Jan
b) 02-Jan
c) 03-Fev
d) 4

21.3.4.8 (996)
Consider a jet engine whose control is based on the Engine Pressure Ratio (EPR):1. with a constant EPR, the thrust decreases when the altitude increases2. with a constant EPR, the thrust is independent of the Mach number3. At same environmental conditions, a given EPR setting maintains the thrust irrespective of engine wear due to ageing.4. the EPR is determined by the impact pressure difference between the turbine outlet and the compressor inlet5. on take-off, in the event of icing not detected by the crew, the indicated EPR is lower than the real EPRThe combination regrouping all the correct statements is :
a) 1, 3.
b) 2, 3, 4.
c) 3, 4, 5.
d) 1, 5.

21.3.4.8 (997)
The Engine Pressure Ratio (EPR) is the ratio of:
a) the total turbine outlet pressure to the total compressor inlet pressure.
b) the total turbine outlet pressure to the total compressor outlet pressure.
c) the total turbine inlet pressure to the total compressor inlet pressure.
d) the total turbine inlet pressure to the total compressor outlet pressure.

21.3.4.8 (998)
The control of free turbine engines on turboprops, is accomplished by:- a propeller control lever used to select: 1 - propeller RPM 2 - turbine temperature 3 - turbine RPM- a fuel control lever used to select: 4 - propeller RPM 5 - torque 6 - turbine temperature The combination which regroups all of the correct statements is :
a) 2001-05-06
b) 2001-03-05
c) 2003-04-06
d) 2002-04-05

21.3.5.1 (999)
On the ground, the Auxiliary Power Unit (APU) can be substituted for the:
a) ground power unit, the starting system, the air conditioning unit.
b) ground power unit, the air conditioning unit.
c) ground power unit, the starting system.
d) ground power unit.

21.3.5.1 (1000)
A modern Auxiliary Power Unit (APU) is designed to provide power for ground starting of an engine. It also supplies both in the air (subject to certification limitations) and on the ground :
a) air conditioning and electrical services.
b) air conditioning and thrust in the event of engine failure.
c) either air conditioning or electrical services, but never both at the same time.
d) air conditioning and electrical services (on the ground) electrical and hydraulic back-up services (in the air).

21.3.5.1 (1001)
In addition to fire detention/protection, most auxiliary power units (APUs) have automatic controls for stating, stopping and maintaining operation within safe limits. These controls provide correct sequencing of the starting cycle as well as protection against :
a) high turbine gas temperature (TGT), overspeed, loss of oil pressure and high oil temperature.
b) high TGT and loss of oil pressure only.
c) overspeed and high oil temperature only.
d) high TGT only.

21.4.1.0 (1002)
Some emergency exits must be equipped with devices so as to help the occupants to get out and reach the ground if their threshold is at a height above the ground greater than:
a) 6 ft, aeroplane on the ground, landing gear extended.
b) 6 ft, aeroplane on the ground, one main gear or nose gear collapse.
c) 8 ft, aeroplane on the ground, one main gear or nose gear collapse.
d) 8 ft, aeroplane on the ground, landing gear extended.

21.4.1.0 (1003)
The number of emergency exits in transport aeroplanes
a) must be arranged to allow all passengers and all crew members to leave the aeroplane within 90 sec. through 50 % of the available emergency exits.
b) must be arranged to allow at least 50 % of all passengers to leave the aeroplane within 2 minutes.
c) depends on the decision of the manufacturer in agreement with the operator.
d) must be in accordance with the number of passengers on board.

21.4.1.0 (1004)
A manual inflation handle:
a) serves to actuate inflation of a slide when automatic inflation fails
b) serves to inflate a life jacket when the normal inflation function fails
c) operates a hand pump for manual inflation of a slide
d) is generally not applied on slides.

21.4.1.0 (1005)
The purpose of the proximity of the emergency evacuation path marking system is to :
a) replace the overhead emergency lighting during an emergency evacuation with a thick smoke.
b) replace the overhead emergency lighting in case of failure.
c) mark only the exits at the floor level.
d) to be used only at night.

21.4.1.0 (1006)
An exit is considered to be out of service when the following elements are inoperative the:1. external door opening mechanism2. internal door opening mechanism3. door opening aid device4. open door locking system5. auxiliary means of evacuation6. emergency lightingThe combination regrouping all the correct statements is:
a) 1, 2, 3, 4, 5, 6
b) 1, 2, 5, 6
c) 2, 3, 4, 6
d) 1, 3, 4, 5

21.4.1.0 (1007)
Evacuation slide inflation is ensured by :
a) a pressurized gas canister combined with the slide itself.
b) the aircraft's general pneumatic circuit.
c) a manual pump, used when needed by the cabin crew.
d) pressurized air from the air conditioning system.

21.4.2.0 (1008)
Smoke detector systems are installed in the
a) upper cargo compartments (class E).
b) wheel wells.
c) engine nacelles.
d) fuel tanks.

21.4.2.0 (1009)
Ion detectors are devices used in aircraft for systems protection. They detect :
a) smoke.
b) overtemperature.
c) fire.
d) overtemperature and fire.

21.4.2.0 (1010)
Smoke detectors fitted on transport aircraft are of the following type :
a) optical or ionization
b) chemical
c) electrical
d) magnetic

21.4.2.0 (1011)
(For this question use annex 021-10164A)The smoke detection in the aircraft cargo compartments is carried out by four sensors: C1, C2, C3 and C4.They are associated with the logic circuit as described in the annex.The repeating bell is activated when:
a) the C1 and C2 sensors detect smoke.
b) the C1 and C3 sensors detect smoke.
c) only one sensor detects smoke.
d) the C2 and C4 sensors detect smoke.

21.4.3.0 (1012)
When a continuous element of a fire detection system is heated:1. its resistance decreases.2. its resistance increases.3. the leakage current increases.4. the leakage current decreases.The combination regrouping all the correct statements is :
a) 1, 3
b) 2, 3
c) 1, 4
d) 2, 4

21.4.3.0 (1013)
A fault protection circuit in a fire detection system will:
a) inhibit the fire detector when the detection line is connected to ground.
b) activate the fire detection system when the detection line is connected to ground.
c) automatically initiate APU shutdown and fire extinguisher striker activation in the event of fire.
d) activate an alarm in the cockpit and in the landing gear bay for ground crew.

21.4.3.0 (1014)
In a fire detection system with single-loop continuous components (with no fault

protection), if the line is accidently grounded:
a) the fire alarm is triggered.
b) the power supply is cut off automatically.
c) there will be no effect on the system
d) the engine fire extinguisher striker is automatically activated.

21.4.3.0 (1015)
When a wire type fire system is tested:
a) the wiring and the warning are tested.
b) Only the warning function is tested.
c) a part of the wire is totally heated.
d) the wire is totally heated.

21.4.3.0 (1016)
A gaseous sensor/responder tube fire sensor is tested by
a) heating up the sensor with test power connection.
b) checking the continuity of the system with a test switch.
c) checking the wiring harness for faults but not the sensor.
d) checking the sensor with pressurized gas.

21.4.3.0 (1017)
In transport aeroplanes overheat detection systems are installed in the:
a) landing gear bays / wheel wells.
b) cabin.
c) fuel tanks.
d) tyres.

21.4.3.0 (1018)
The indication of the fire detection systems is performed by a:
a) warning light and a warning bell (or aural alert).
b) warning bell.
c) warning light.
d) gear warning.

21.4.3.0 (1019)
On a multi-engined aircraft a fire detection system includes :
a) a warning light for each engine and a single alarm bell common to all engines
b) a single warning light but a separate alarm bell for each engine
c) a single warning light and a single alarm bell
d) both a warning light and an alarm bell unique to each engine

21.4.3.0 (1020)
In order to enable a fire to be controlled as quickly as possible, the fire detectors are located in the highest risk compartments. Theses compartments are :1. the main landing gear wheel wells2. the fuel tanks3. the oil tanks4. the auxiliary power unit5. around the enginesThe combination regrouping all the correct statements is:
a) 1,4,5
b) 2,3
c) 2,5
d) 1,2,3,4,5

21.4.3.0 (1021)
Continuous loop fire detector systems operate on the principle that an increase in temperature produces :
a) a decrease in resistance
b) an increase in resistance
c) a decrease in the reference current
d) a decrease in pressure

21.4.3.0 (1022)
A Continuous-Loop-Detector-System is a:
a) Fire detection system
b) Smoke detection system
c) Carbon dioxide warning system
d) Fire fighting system

21.4.3.0 (1023)
On an aircraft provided with resistance and capacitance variation type fire detection loops, a fire alarm is initiated by a temperature increase detected:
a) at any isolated point of the loops or else generally on all the loops
b) only at an isolated point of the loops
c) only in a uniform way along the loops
d) on at least one loop

21.4.3.0 (1024)
When a bimetallic strip is used as a switch in a fire detection loop, a fire alarm is triggered after a delay. The purpose of this delay is to:
a) avoid false alarms in case of vibrations
b) allow temperatures to equalise
c) delay the triggering of the fire extinguinshers and increase their efficiency
d) wait for the triggering of the second fire detection loop in order to confirm the fire

21.4.4.0 (1025)
The most common extinguishing agent used in gas turbine engine fire protection system is:
a) Freon.
b) Water.
c) CO2.
d) Powder.

21.4.4.0 (1026)
If inflammable gaseous materials, like propane for example, are set on fire, the following extinguisher types should be used for fire fighting:
a) BCF and CO2 type extinguishers
b) Water type extinguishers
c) Dry and water type extinguishers
d) CO2 and water type extinguishers

21.4.4.0 (1027)
The most suitable means for extinguishing a magnesium fire on the ground is :
a) sand.
b) water.

c) carbon dioxide.
d) freon.

21.4.4.0 (1028)
In the cockpit of a transport airplane, at least one manual fire-extinguisher must be conveniently located containing :
a) halon.
b) powder.
c) water.
d) special fluids.

21.4.4.0 (1029)
(For this question use annex 021-9377A)When fire is detected on engine n°2, the fire shutoff handle n°2 is pulled and the extinguishing agent n°1 is discharged. This results in :
a) the discharge of fire extinguisher bottle n°1 and illumination of the DISCH (discharge) indicator lamp
b) the discharge of fire extinguisher bottle n°1 and illumination of the DISCH indicator lamp of agent n°1 on both engines
c) the discharge of fire extinguisher bottle n°1 and illumination of the DISCH indicator lamp of agent n°1 on engine no. and DISCH indicator lamp of agent n°2 on engine n°1
d) the discharge of fire extinguisher bottle n°2 and illumination of the DISCH indicator lamp of agent n°1 on engine n°1 and agent n°2 on engine n°2

21.4.4.0 (1030)
Generally, when the fire handle of the fire-extinguishing system on an aircraft is pulled, the effects are :1. closing of the LP valve of the fuel system2. opening of the air bleed valves and HP valves on the engine concerned3. setting of extinguishing systems4. closing of the isolation and de-icing valves5. isolation of the associated electric current generators6. immediate discharge of extinguishing agentThe combination regrouping all the correct statements is:
a) 1,3,4,5
b) 1,2,5,6
c) 2,3,4,5
d) 1,3,4

21.4.4.0 (1031)
With engine fire alarm activated, the extinguisher discharge:
a) is the pilot's task
b) is automatic and immediate
c) is automatic after a delay to allow the pilot to stop the engine
d) does not need the engine to be stopped

21.4.4.0 (1032)
The main feature of BCF fire extinguishers is that they :
a) act as flame inhibitors by absorbing the air's oxygen.
b) use the cooling effect created by the venturi during discharge.
c) are electrical conductors.
d) are highly corrosive particularly for aluminium alloys.

21.4.4.0 (1033)
An airplane whose maximum approved passenger seating configuration is 7 to 30 seats must be equipped with at least:
a) 1 hand fire-extinguisher conveniently located in the passenger compartment.
b) 2 hand fire-extinguishers conveniently located in the passenger compartment.
c) 3 hand fire-extinguishers conveniently located in the passenger compartment.
d) 4 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1034)
An airplane whose maximum approved passenger seating configuration is 31 to 60 seats must be equipped with at least:
a) 2 hand fire-extinguishers conveniently located in the passenger compartment.
b) 3 hand fire-extinguishers conveniently located in the passenger compartment.
c) 4 hand fire-extinguishers conveniently located in the passenger compartment.
d) 5 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1035)
An airplane whose maximum approved passenger seating configuration is 61 to 200 seats must be equipped with at least:
a) 3 hand fire-extinguishers conveniently located in the passenger compartment.
b) 2 hand fire-extinguishers conveniently located in the passenger compartment.
c) 4 hand fire-extinguishers conveniently located in the passenger compartment.
d) 5 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1036)
An airplane whose maximum approved passenger seating configuration is 201 to 300 seats must be equipped with at least:
a) 4 hand fire-extinguishers conveniently located in the passenger compartment.
b) 3 hand fire-extinguishers conveniently located in the passenger compartment.
c) 5 hand fire-extinguishers conveniently located in the passenger compartment.
d) 6 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1037)
An airplane whose maximum approved passenger seating configuration is 301 to 400 seats must be equipped with at least:
a) 5 hand fire-extinguishers conveniently located in the passenger compartment.
b) 4 hand fire-extinguishers conveniently located in the passenger compartment.
c) 6 hand fire-extinguishers conveniently located in the passenger compartment.
d) 3 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1038)
An airplane whose maximum approved passenger seating configuration is 401 to 500 seats must be equipped with at least:
a) 6 hand fire-extinguishers conveniently located in the passenger compartment.
b) 5 hand fire-extinguishers conveniently located in the passenger compartment.
c) 7 hand fire-extinguishers conveniently located in the passenger compartment.
d) 8 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1039)
An airplane whose maximum approved passenger seating configuration is 501 to 600 seats must be equipped with at least:

a) 7 hand fire-extinguishers conveniently located in the passenger compartment.
b) 8 hand fire-extinguishers conveniently located in the passenger compartment.
c) 6 hand fire-extinguishers conveniently located in the passenger compartment.
d) 5 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1040)
An airplane whose maximum approved passenger seating configuration is greater than 600 seats must be equipped with at least:
a) 8 hand fire-extinguishers conveniently located in the passenger compartment.
b) 9 hand fire-extinguishers conveniently located in the passenger compartment.
c) 7 hand fire-extinguishers conveniently located in the passenger compartment.
d) 6 hand fire-extinguishers conveniently located in the passenger compartment.

21.4.4.0 (1041)
An airplane whose maximum approved passenger seating configuration is greater than 60 seats must be equipped with at least:
a) 3 HALON 1211 fire-extinguishers.
b) 2 HALON 1211 fire-extinguishers.
c) 4 HALON 1211 fire-extinguishers.
d) 1 HALON 1211 fire-extinguisher.

21.4.4.0 (1042)
In accordance with JAR-OPS 1, an airplane whose maximum take-off mass exceeds 5 700 kg or whose maximum approved passenger seating configuration is greater than 9 seats and smaller than 200 seats must be equipped with a:
a) crash axe or a crow-bar in the pilot compartment.
b) crash axe and a crow-bar in the passenger compartment.
c) crash axe in the cockpit and a crow-bar in the passenger compartment.
d) crow-bar in the cockpit and a crash axe in the passenger compartment.

21.4.4.0 (1043)
In accordance with JAR-OPS 1, an airplane must be equipped with equipment or systems at each emergency exit that allow to reach the ground safely in the case of an emergency when the sill height of the passenger emergency exit is higher than:
a) 1,83 m.
b) 1,80 m.
c) 1,86 m.
d) 1,89 m.

21.4.4.0 (1044)
In accordance with JAR-OPS 1, during and following an emergency descent, each occupant of the cockpit seats on duty must have access to a minimum amount of oxygen in:1. order to maintain a supply throughout the entire flight time where the cabin altitude pressure is greater than 13000 ft.2. order to maintain a supply throughout the entire flight time where the cabin altitude pressure is greater than 10000 ft and smaller than 13000 ft minus 30 minutes.3. no case less than 30 minutes for airplanes certified to fly up to 25000 ft.4. no case less than 2 hours for airplanes certified to fly at over 25000 ft.The combination regrouping all the correct statements is:
a) 1, 2, 3 et 4.
b) 1, 2.
c) 1, 2, 4.
d) 1,4.

21.4.4.0 (1045)
In accordance with JAR-OPS 1, the minimum requirement for the survival oxygen needed to supply 100 % of the passengers during and following an emergency descend is:
a) 10 minutes or the entire flight time where the cabin pressure altitude is above 15000 ft, whichever is the greater.
b) 30 minutes.
c) the entire flight time where the cabin pressure altitude is above 13000 ft.
d) the entire flight time where the cabin pressure altitude is above 10000 ft minus 30 minutes.

21.4.5.0 (1046)
The oxygen masks have dropped down from the passengers service units. The oxygen flow starts :
a) after pulling the oxygen mask downwards
b) immediately
c) only above FL200
d) After the system has been switched on by a crew member

21.4.5.0 (1047)
A public transport jet aeroplane may be operated up to FL 450. The cabin includes 180 passenger seats, made up of 30 rows (3 seats from each side of central aisle). The minimum number of cabin oxygen masks for this aeroplane must be:
a) 198 (110% of the seating capacity).
b) 270 (150% of the seating capacity).
c) 240 (one additional mask per seat block).
d) 210 (one additional mask per seat row).

21.4.5.0 (1048)
When quick donning masks are in use, the pilot is:
a) able to radiotelephone.
b) only able to receive.
c) only able to transmit.
d) not able to do any radio communication.

21.4.5.0 (1049)
In a pressurized aircraft, the first-aid (therapeutic) oxygen is designed to:
a) give medical assistance to passengers with pathological respiratory disorders.
b) protect the flight crew and cabin attendants against fumes and noxious gases.
c) protect all the occupants against the effects of accidental depressurisation.
d) protect certain passengers, and is only carried on board for these people.

21.4.5.0 (1050)
An aircraft is scheduled to fly from PARIS to MARSEILLE at FL 390 and has the following characteristics:Maximum permissible number of passenger specified by the certificate of airworthiness= 230Number of seats on board= 200Scheduled number of passengers on board= 180The minimum number of inhaler systems provided in the aircraft cabin should be:

a) 220.
b) 230.
c) 200.
d) 180.

21.4.5.0 (1051)
From which flight level do the regulations require a quick donning type oxygen mask for the flight crew in a pressurized aircraft ?
a) FL 250.
b) FL 300.
c) FL 390.
d) FL 100.

21.4.5.0 (1052)
What is breathed in when using a passenger oxygen mask?
a) Cabin air and oxygen.
b) 100% oxygen.
c) Cabin air and oxygen or 100% oxygen.
d) A mixture of oxygen and freon gas.

21.4.5.0 (1053)
The safety precautions to be taken whenever using oxygen are:1. refrain from smoking, avoid sparkes.2. Avoid operation of radio communication equipment.3. Slowly operate oxygen system valves.4. Avoid greasy matter.The combination regrouping all the correct statements is :
a) 1, 3, 4.
b) 1, 2, 3.
c) 2, 3, 4.
d) 1, 2, 4.

21.4.5.0 (1054)
The opening of the doors giving access to the oxygen masks for the passengers is :1. pneumatic for the gaseous oxygen system,2. electrical for the chemical oxygen system,3. pneumatic for the chemical oxygen system,4. electrical for the gaseous oxygen system.The combination regrouping all the correct statements is:
a) 1, 2
b) 1, 3
c) 2, 3
d) 2, 4

21.4.5.0 (1055)
The state in which the breathing oxygen for the cockpit of jet transport aeroplanes is stored is :
a) Gaseous.
b) Chemical compound.
c) Liquid.
d) Gaseous or chemical compound..

21.4.5.0 (1056)
If the maximum operating pressure of the oxygen system is exceeded the:
a) oxygen is discharged overboard via a safety plug.
b) oxygen becomes unusable for the passengers.
c) passenger oxygen masks will drop down.
d) oxygen bottles will explode.

21.4.5.0 (1057)
The purpose of a diluter demand regulator in an oxygen system is to :
a) deliver oxygen flow when inhaling.
b) deliver oxygen flow only above FL 100.
c) is only recommended with smoke in the cockpit.
d) mix air and oxygen in a passenger oxygen mask.

21.4.5.0 (1058)
The built-in passenger oxygen system be activated by :
a) switching the passenger oxygen ON.
b) switching the diluter demand regulator ON.
c) opening the oxygen-bottle valves.
d) switching the diluter demand regulator and the passenger oxygen ON.

21.4.5.0 (1059)
The passenger oxygen mask will supply :
a) a mixture of cabin air and oxygen.
b) 100 % oxygen.
c) a mixture of compressed air and oxygen or 100 % oxygen.
d) a mixture of oxygen and freon gas.

21.4.5.0 (1060)
The chemical oxygen generator is a system:1. which is inexpensive2. requiring no external input3. which is lightweight4. requiring no maintenance5. with adjustable flow rate6. which is unsafeThe combination regrouping all the correct statements is:
a) 1, 3, 4
b) 2, 3, 6
c) 1, 4, 6
d) 2, 4, 5

21.4.5.0 (1061)
Consider the flight deck oxygen supply system. The purpose of the oxygen regulator (as a function of demand and altitude) is to:1. decrease oxygen pressure from 1800 PSI (in the bottles) down to about 50-75 PSI (low pressure system)2. supply pure oxygen3. supply diluted oxygen4. supply oxygen at normal pressure5. supply oxygen at emergency/positive pressure6. trigger the continuous cabin altitude warning at 10000 ft cabin altitudeThe combination regrouping all the correct statements is:
a) 2, 3, 4, 5
b) 3, 4, 5, 6
c) 1, 2, 3, 4
d) 1, 3, 4, 6

21.4.5.0 (1062)
A public transport aircraft is operated at FL 390. The total number of oxygen dispensing units and outlets in the cabin must be at least the same as the total

number of :
a) seats exceeded by 10%.
b) seats.
c) passengers.
d) passengers exceeded by 10%.

21.4.5.0 (1063)
A public transport aircraft has a cruising altitude of FL 390. It is fitted with individual oxygen masks for the passengers. In the event of depressurisation, the masks must be automatically released before the cabin pressure altitude exceeds:
a) 15000 ft.
b) 13000 ft.
c) 12000 ft.
d) 14000 ft.

21.4.5.0 (1064)
Above what flight level must one pilot wear an oxygen mask at all times during commercial flight.
a) 410.
b) 300.
c) 250.
d) 490.

21.4.5.0 (1065)
A diluter demand oxygen regulator :
a) delivers oxygen flow when inhaling.
b) delivers oxygen flow only above FL 100.
c) is only recommended for use with smoke in the cockpit.
d) mixes air and oxygen in a passenger oxygen mask.

21.4.5.0 (1066)
A jet aircraft is certified for the carriage of 120 passengers. 42 passenger are on board and the expected Flight Level on route Paris-Alger is FL 330. The first aid oxygen to be on board at departure shall provide breathing supply for at least:
a) 1 passenger for the entire flight after cabin depressurization at cabin altitude of more than 8000 ft.
b) no first aid required.
c) 1 passenger for the entire flight after cabin depressurization at cabin altitude between 10000 and 14000 ft.
d) 3 passengers for the entire flight after cabin depressurization at cabin altitude between 10000 and 14000 ft.

21.4.5.0 (1067)
As regards passengers oxygen in public transport aircraft, information must be given to passengers through a demonstration. If a flight is to be carried out at Flight Level FL 290, this demonstration must be completed before :
a) take-off.
b) the aircraft reaches FL 100.
c) the aircraft reaches FL 140.
d) the aircraft reaches FL 250.

21.4.5.0 (1068)
In jet transport aircraft, breathing oxygen for the cockpit is stored in the following state:
a) gaseous.
b) liquid.
c) chemical.
d) chemical or gaseous.

21.4.5.0 (1069)
Oxygen systems are systems used on pressurized airplanes in :1. an emergency in the case of depressurization.2. an emergency in the case of the indisposition of a passenger.3. normal use in order to supply oxygen to the cabin.5. an emergency in the case of smoke or toxic gases.The combination regrouping all the correct statements is:
a) 1,4
b) 1, 2, 4
c) 3
d) 2, 3

21.4.5.0 (1070)
Modern pressurized transport airplanes are equipped with :
a) two independent oxygen systems, one supplying the cockpit, the other the cabin.
b) only one oxygen system supplying the whole aircraft.
c) two oxygen systems both supplying the cockpit and the cabin.
d) only portable oxygen bottles.

21.4.5.0 (1071)
Generally speaking when the oxygen flows to the masks in the passenger cabin, the system is activated by
a) firmly pulling the mask towards the face, after the cover has opened.
b) activating the relevant switch in the cockpit.
c) firmly pulling the cover behind which the oxygen mask is stowed.
d) pushing the mask against the face and breath normally.

21.4.5.0 (1072)
A pressurized aeroplane is operated at FL 300. It undergoes a rapid decompression so that the pressure in the cabin goes quickly down to the outside pressure value. What happens concerning the oxygen system ?
a) the oxygen masks are automatically presented to cabin crew members and passengers
b) the oxygen masks are automatically presented to flight crew members
c) if the automatic mask presentation has been activated, the oxygen will flow within the first 3 minutes
d) manual override of the automatic presentation of passenger oxygen masks is, generally speaking, not possible

21.4.5.0 (1073)
A substance which may never be used in the vicinity or on parts of an oxygen installation is :
a) Grease

b) Water
c) Halon
d) Nitrogen

21.4.5.0 (1074)
The type of a aircraft oxygen system intended for use by passengers, is mostly :
a) a continuous flow system
b) a pressure demand system
c) portable equipment only
d) an air recycle system

21.4.5.0 (1075)
The demand valve of a diluter-demand type oxygen regulator in normal mode, operates when the :
a) user breathes in
b) diluter control is in normal position
c) user requires 100 percent oxygen
d) pressure in the oxygen reservoir is more than 500 psi

21.4.5.0 (1076)
The purpose of the ""Pressure Relief Valve"" in a high pressure oxygen system is to :
a) relieve overpressure if the pressure reducing valve malfunctions
b) reduce pressure in the oxygen reservoir to a suitable manifold pressure for the regulator
c) act as a manual shut-off valve
d) maximize the charging pressure of the system

21.4.5.0 (1077)
The purpose of the first aid oxygen is to:
a) provide some passengers with additional respiratory assistance after an emergency descent following a depressurization.
b) provide the cabin attendants with respiratory protection.
c) supply all the passengers in case of depressurization.
d) provide the flight crew with respiratory assistance after depressurization.

21.4.5.0 (1078)
The survival oxygen is:
a) the oxygen supplied to the airplane occupants in case of accidental depressurization.
b) the oxygen supplied to a passenger who needs oxygen for pathological reasons.
c) the oxygen used for protection against smoke and carbon dioxide.
d) a therapeutical oxygen specifically carried for certain passengers.

21.4.5.0 (1079)
Airliners are equipped with oxygen systems. It can be said that :
a) with setting on ""NORMAL"", the crew breathes a mixture of oxygen / cabin air.
b) the same circuit is used by the crew and the passengers.
c) the seals must be carefully greased to avoid sparks.
d) the passenger circuit never uses chemically generated oxygen.

21.4.5.0 (1080)
An oxygen regulator has 3 controls :- a power lever : ON/OFF- an ""O2"" lever : NORMAL/100%- an emergency lever : ON/OFFAmong the following statements, the correct proposition is :
a) the power lever on ON, and, the ""O2"" lever on NORMAL allows the oxygen to enter the regulator and enables breathing of a mixture of air/oxygen according to altitude.
b) the EMERGENCY lever on ON enables breathing of pure oxygen at ambient pressure.
c) the ""O2"" lever on ON enables breathing of the over-pressure oxygen at a constant flow rate.
d) with the EMERGENCY lever on OFF, in an emergency situation, one cannot use the oxygen mask to breathe.

21.4.5.0 (1081)
The operations of an airline plan the operation of a pressurized aircraft at a 240 flight level on its whole route with 150 passengers on board.As concerns the regulatory requirements about oxygen:1. each crew member will have available a quick fitting inhaler device.2. the aircraft will be equipped with a warning system indicating that the cabin altitude is higher than 3 000 m.3 . the quantity of oxygen on board will be sufficient for the supply of 100 % of the occupants during the whole flight time above the flight level 150 after an eventual depressurization.4. the first aid quantity of oxygen will be sufficient for the supply of two passengers during the whole flight time when the cabin altitude is greater than 8 000 feet.The combination regrouping all the correct statements is:
a) 2,3
b) 1,2,3,4
c) 2
d) 3,4

21.4.5.0 (1082)
When selected to normal, the oxygen proportion of the air/oxygen mixture supplied by the cockpit oxygen system regulator:
a) increases when the altitude increases.
b) decreases when the altitude increases.
c) is constant whatever the altitude.
d) is 100 %.

21.4.5.0 (1083)
In the cabin, when the oxygen mask is pulled downwards, the passenger breathes :
a) a mixture of oxygen and cabin air.
b) pure oxygen under pressure.
c) pure oxygen at the ambient pressure.
d) cabin air under pressure.

21.4.5.0 (1084)
Chemical oxygen generators are used to furnish oxygen to the :
a) cabin only.
b) cockpit and the cabin.
c) cockpit only.
d) toilets only.

21.4.5.0 (1085)
The chemical oxygen generator supplies oxygen for about :
a) 15 minutes.
b) 30 minutes.
c) 2 hours.
d) 5 minutes.

21.4.5.0 (1086)
The advantages of a chemical oxygen source for the passenger cabin are :1. reduced weight and volume,2. easy storage and maintenance,3. greater autonomy,4. no risk of explosion,5. reversible functioning,6. no maintenance.The combination regrouping all the correct statements is:
a) 1, 2, 4, 6
b) 1, 2, 3, 4, 5, 6
c) 2, 3, 5
d) 1, 3, 4, 5

21.4.5.0 (1087)
The disadvantages of a chemical oxygen source for the passenger cabin are :1. a flow which cannot be modulated,2. a heavy and bulky system,3. non reversible functioning,4. risks of explosion,5. poor autonomy.The combination regrouping all the correct statements is:
a) 1, 3, 5
b) 1, 2, 3, 4, 5
c) 2, 4
d) 1, 2, 3, 5

21.4.5.0 (1088)
The advantages of a gaseous oxygen source for the passenger cabin are :1. a greater autonomy,2. no risk of explosion,3. reversible functioning,4. easy storage and maintenance,5. possibility to regulate flow.The combination regrouping all the correct statements is :
a) 1, 3, 5
b) 1, 2, 3, 4, 5
c) 2, 4, 5
d) 2, 3, 4

21.4.5.0 (1089)
When the door operation of a transport airplane equipped with evacuation slides is controlled from the outside, the slide:
a) is disarmed automatically.
b) unfolds and becomes inflated.
c) unfolds but does not become inflated.
d) becomes inflated in its packboard thus preventing its unfolding.

21.4.5.0 (1090)
The equipment of an oxygen supply installation must be kept absolutely free of oil or grease traces as:
a) these substances catch fire spontaneously in the presence of oxygen under pressure.
b) the oxygen system would be contaminated.
c) these substances mixed with oxygen could catch fire in the presence of a spark.
d) these substances could plug the oxygen masks filters.

21.4.5.0 (1091)
A passenger emergency mask is a :
a) continuous flow mask and cannot be used if there is smoke in the cabin.
b) mask with flow on request and cannot be used if there is smoke in the cabin.
c) continuous flow mask and can be used if there is smoke in the cabin.
d) mask with flow on request and can be used if there is smoke.

21.4.5.0 (1092)
A smoke mask is a :
a) mask with flow on request and covers the whole face.
b) continuous flow mask and covers the whole face.
c) mask with flow on request and covers only the nose and the mouth.
d) continuous flow mask and covers only the nose and the mouth.

21.4.5.0 (1093)
In accordance with JAR-OPS 1, each occupant of the cockpit seats on duty in a non-pressurized airplane must have an oxygen supply reserve for the entire flight time at pressure altitudes greater than:
a) 10000 ft.
b) 12500 ft.
c) 13000 ft.
d) 14000 ft.

21.4.5.0 (1094)
In accordance with JAR-OPS 1, 100 % of the passengers in a non-pressurized airplane must have an oxygen supply reserve for the entire flight time at pressure altitudes greater than:
a) 13000 ft.
b) 10000 ft.
c) 14000 ft.
d) 15000 ft.

21.4.5.0 (1095)
In accordance with JAR-OPS 1, 10 % of the passengers in a non-pressurized airplane must have an oxygen supply reserve for the entire flight time when the cabin altitude pressure is greater than:
a) 10000 ft but not exceeding 13000 ft minus 30 minutes.
b) 13000 ft.
c) 10000 ft.
d) 10000 ft but not exceeding 13000 ft.

21.4.5.0 (1096)
In accordance with JAR-OPS 1, when an airplane flies at over 25000 ft, the total number of oxygen dispensing units and supply terminals must be at least greater than the number of:
a) seats by 10 %.
b) passengers by 10 %.

c) seats by 30 %.
d) passengers by 30%.

21.4.5.0 (1097)
In case of smoke in the cockpit, the crew oxygen regulator must be set to:
a) 100%
b) normal.
c) emergency.
d) on demand.

21.4.5.0 (1098)
The installation and use of on-board oxygen generators is such that:1 - the smoking ban is imperative when used2 - in case of accidental drop of the ""continuous flow"" passenger masks, no crew action is required3 - no trace of grease must be found in the system assembly4 - the system's filling adaptors must be greased with non freezable or graphite greaseThe combination which regroups all of the correct statements is :
a) 03-Jan
b) 04-Jan
c) 03-Fev
d) 04-Fev

21.4.6.0 (1099)
In a pressurized transport aircraft, the protective breathing equipment:
a) protects the members of the crew against fumes and noxious gases.
b) gives medical assistance to certain passengers with respiratory disorders.
c) protects all the occupants against the effects of accidental depressurization.
d) protects the members of the crew against the effects of accidental depressurization.

21.4.6.0 (1100)
An operator shall not operate an aeroplane certicated to JAR25, across an area in which search and rescue would be especially difficult, without survival equipment if it flies away from an area suitable for making an emergency landing at a distance greater than :
a) 90 minutes at cruising speed.
b) 60 minutes at cruising speed.
c) 30 minutes at cruising speed.
d) 120 minutes at cruising speed.

21.4.6.0 (1101)
A turboprop aeroplane is performing an overwater flight, which takes it further than 340 NM away from an aerodrome where an emergency landing could be performed. Normal cruising speed is 180 kt. One engine out airspeed is 155 kt.
a) Life jackets must be available for all occupants.
b) The regulation does not require life jackets or rafts to be taken on board in this particular case.
c) Life jackets and rafts must be available for all occupants.
d) Life rafts must be available for all occupants.

21.4.6.0 (1102)
The number of hand fire extinguishers which have to be installed in the passenger cabin according to JAR-OPS depends on the number of :
a) seats in the cabin.
b) seat rows in the cabin.
c) passengers in the cabin.
d) emergency exits in the cabin.

21.4.6.0 (1103)
The crash/fire axe is part of the safety equipment fitted to passenger aircraft. Its function is to :
a) obtain forced access to a fire behind a panel and a general purpose tool during evacuation.
b) free exits in case of evacuation via the sides.
c) activate a radio survival beacon by cutting off the red coloured top
d) settle an escalating conflict with unreasonable passengers, who threaten flight safety.

21.4.6.0 (1104)
In accordance with the JAR-OPS, an airplane constituted of only one passenger deck, equipped with 61 seats and effectively carrying passengers, must be equipped with :
a) 1 megaphone.
b) 2 megaphones.
c) 2 megaphones if there are more than 31 passengers on board.
d) no megaphone.

21.4.6.0 (1105)
In accordance with the JAR-OPS and with the exception of amphibians and hydroplanes, the carriage of a life jacket per person on board is compulsory when the airplane is :1. cruising at such a distance from the shore that it would not be able to return in the case of an engine failure.2. is flying over a water surface at more than 50 NM off shore.3. is using departure and arrival paths above the water and when a ditching probability exists in the case of a problem.4. is flying over a stretch of water at more than 100 NM off shore.The combination regrouping all the correct statements is:
a) 2, 3
b) 1, 2, 3, 4
c) 1, 2
d) 3, 4

21.4.6.0 (1106)
The number of manual fire-extinguishers, on board the passenger cabin of an airplane, whose maximum approved configuration for passenger seats is 31, is:
a) 2
b) 1
c) 3
d) 0

21.4.6.0 (1107)
The number of crash axes on board an airplane, whose maximum approved configuration of passenger seats is 201, is :
a) 2
b) 1

c) 3
d) 4

21.4.6.0 (1108)
A public transport passengers aircraft, with a seating configuration of more than 61 seats, must have in its passenger compartment(s), at least 3 portable fire-extinguishers including:
a) 2 halon fire-extinguishers.
b) 1 halon fire-extinguisher.
c) 3 halon fire-extinguishers.
d) no halon fire-extinguisher.

21.4.6.0 (1109)
In a ditching situation, the passenger life jackets will be inflated :
a) when leaving the airplane.
b) immediately on the opening of the exits.
c) immediately on ditching.
d) once the passengers are in the water.

21.4.6.0 (1110)
An aircraft whose maximum approved configuration for passenger seats is 10 seats must be equipped with:
a) one fire-extinguisher in the cockpit and three fire-extinguishers in the passenger cabin.
b) one fire-extinguisher in the cockpit and two fire- extinguishers in the passenger cabin.
c) three fire-extinguishers in the passenger cabin only.
d) two fire-extinguishers in the cockpit and two fire-extinguishers in the passenger cabin.

21.4.6.0 (1111)
There are 60 passengers and crew members on board a turbo-prop aircraft. Its speed is 240 kt. At a point along the course steered, above the sea, the aircraft is at 1h45 min from an airdrome suitable for emergency landing. The minimum equipment complying with regulations is :
a) 60 life jackets and three 30-seat life boats
b) 60 life jackets
c) One 30-seat life boat and two 20-seat life boats
d) 60 life jackets, two 30-seat life boats

21.4.6.0 (1112)
The emergency lighting system must be able to function and supply a certain level of lighting after the main electric power system has been cut off for at least:
a) 10 minutes
b) 90 seconds
c) 5 minutes
d) 30 minutes

21.4.6.0 (1113)
An aircraft whose maximum approved configuration for passenger seats is 200 seats must be equipped with:
a) 3 manual fire-extinguishers in the passenger cabin.
b) 5 manual-fire extinguishers in the passenger cabin.
c) 7 manual-fire extinguishers in the passenger cabin.
d) 4 manual fire-extinguishers in the passenger cabin.

21.4.6.0 (1114)
The pyrotechnic means used in case of an emergency to indicate your position to the emergency teams are a flare:
a) which is used at night and a smoke device which is used in the daytime.
b) and a smoke device which are only used at night.
c) which is used at daytime and a smoke device which is used at night.
d) and a smoke device which are only used in the daytime.

21.4.6.0 (1115)
The portable emergency beacons which are used after an emergency landing or ditching have a duration of :
a) 48 h
b) 24 h
c) 12 h
d) 72 h

21.4.6.0 (1116)
In accordance with JAR-OPS 1 and if necessary, the number of liferafts to be found on board an aircraft must allow the transportation of the entire aircraft occupants:
a) in the case of a loss of one raft of the largest rated capacity.
b) plus 10 %.
c) plus 30 %.
d) in the case of a loss of two rafts.

22.1.1.0 (1117)
In a standard atmosphere and at the sea level, the calibrated airspeed (CAS) is :
a) equal to the true airspeed (TAS).
b) independent of the true airspeed (TAS).
c) higher than the true airspeed (TAS).
d) lower than the true airspeed (TAS).

22.1.1.1 (1118)
The pressure measured at the forward facing orifice of a pitot tube is the :
a) total pressure.
b) static pressure.
c) total pressure plus static pressure.
d) dynamic pressure.

22.1.1.1 (1119)
A pitot blockage of both the ram air input and the drain hole with the static port open causes the airspeed indicator to :
a) react like an altimeter.
b) read a little high.
c) read a little low.
d) freeze at zero.

and the longitudinal CG-position is at 3.10 m.Determine the longitudinal CG position in the following conditions :- pilot and front passenger : 150 kg- rear passengers : 150 kg- fuel : 500 kg
a) 2.91 m
b) 2.85 m
c) 2.97 m
d) 2.82 m

31.3.2.4 (1717)
Length of the mean aerodynamic chord = 1 mMoment arm of the forward cargo: -0,50 mMoment arm of the aft cargo: + 2,50 mThe aircraft mass is 2 200 kg and its centre of gravity is at 25% MACTo move the centre of gravity to 40%, which mass has to be transferred from the forward to the aft cargo hold?
a) 110 kg
b) 183 kg
c) 165 kg
d) 104 kg

31.3.3.1 (1718)
Loads must be adequately secured in order to:
a) avoid unplanned centre of gravity (cg) movement and aircraft damage.
b) avoid any centre of gravity (cg) movement during flight.
c) prevent excessive 'g'-loading during the landing flare.
d) allow steep turns.

31.3.3.2 (1719)
Assume:Aeroplane gross mass: 4750 kgCentre of gravity at station: 115.8What will be the new position of the centre of gravity if 100 kg is moved from the station 30 to station 120?
a) Station 117.69
b) Station 118.33
c) Station 120.22
d) Station 118.25

32.1.1.0 (1720)
Density altitude is the
a) pressure altitude corrected for 'non standard' temperature
b) altitude reference to the standard datum plane
c) altitude read directly from the altimeter
d) height above the surface

32.1.1.0 (1721)
The Density Altitude
a) is used to determine the aeroplane performance.
b) is equal to the pressure altitude.
c) is used to establish minimum clearance of 2.000 feet over mountains.
d) is used to calculate the FL above the Transition Altitude.

32.1.1.0 (1722)
Given that:VEF= Critical engine failure speed VMCG= Ground minimum control speedVMCA= Air minimum control speed VMU= Minimum unstick speedV1= Take-off decision speedVR= Rotation speedV2 min.= Minimum take-off safety speedThe correct formula is:
a) VMCG<=VEF < V1
b) 1.05 VMCA<= VEF<= V1
c) 1.05 VMCG< VEF<= VR
d) V2min<= VEF<= VMU

32.1.1.0 (1723)
Given:VS= Stalling speedVMCA= Air minimum control speed VMU= Minimum unstick speed (disregarding engine failure)V1= take-off decision speedVR= Rotation speedV2 min.= Minimum take-off safety speedVLOF: Lift-off speed The correct formula is:
a) VS< VMCA< V2 min
b) VR< VMCA< VLOF
c) VMU<= VMCA< V1
d) V2min< VMCA> VMU

32.1.1.0 (1724)
Regarding take-off, the take-off decision speed V1:
a) is the airspeed on the ground at which the pilot is assumed to have made a decision to continue or discontinue the take-off.
b) is always equal to VEF (Engine Failure speed).
c) is an airspeed at which the aeroplane is airborne but below 35 ft and the pilot is assumed to have made a decision to continue or discontinue the take-off .
d) is the airspeed of the aeroplane upon reaching 35 feet above the take-off surface.

32.1.1.0 (1725)
The point where Drag coefficient/Lift coefficient is a minimum is
a) the point where a tangent from the origin touches the drag curve.
b) the lowest point of the drag curve.
c) at stalling speed (VS).
d) on the ""back side"" of the drag curve.

32.1.1.0 (1726)
Which of the following statements is correct?
a) Induced drag decreases with increasing speed.
b) Induced drag increases with increasing speed.
c) Induced drag is independant of the speed.
d) Induced drag decreases with increasing angle of attack.

32.1.1.0 (1727)
The point at which a tangent out of the origin touches the power required curve
a) is the point where the Lift to Drag ratio is a maximum.
b) is the point where Drag coefficient is a minimum.
c) is the point where the Lift to Drag ratio is a minimum.
d) is the maximum drag speed.

32.1.1.0 (1728)
On a reciprocating engined aeroplane, to maintain a given angle of attack, configuration and altitude at higher gross mass
a) the airspeed and the drag will be increased.

b) the airspeed will be decreased and the drag increased.
c) the lift/drag ratio must be increased.
d) the airspeed will be increased but the drag does not change.

32.1.1.0 (1729)
On a reciprocating engined aeroplane, to maintain a given angle of attack, configuration and altitude at higher gross mass
a) an increase in airspeed and power is required.
b) a higher coefficient of drag is required.
c) an increase in airspeed is required but power setting does not change.
d) requires an increase in power and decrease in the airspeed.

32.1.1.0 (1730)
On a reciprocating engined aeroplane, with increasing altitude at constant gross mass, angle of attack and configuraton the drag
a) remains unchanged but the TAS increases.
b) remains unchanged but the the CAS increases.
c) increases at constant TAS.
d) decreases and the CAS decreases too because of the lower air density.

32.1.1.0 (1731)
On a reciprocating engined aeroplane, with increasing altitude at constant gross mass, angle of attack and configuraton the power required
a) increases and the TAS increases by the same percentage.
b) increases but TAS remains constant.
c) decreases slightly because of the lower air density.
d) remains unchanged but the TAS increases.

32.1.1.0 (1732)
A lower airspeed at constant mass and altitude requires
a) a higher coefficient of lift.
b) less thrust and a lower coefficient of lift.
c) more thrust and a lower coefficient of lift.
d) more thrust and a lower coefficient of drag.

32.1.1.0 (1733)
The coefficient of lift can be increased either by flap extension or by
a) increasing the angle of attack.
b) increasing the TAS.
c) decreasing the 'nose-up' elevator trim setting.
d) increasing the CAS.

32.1.1.0 (1734)
The speed VS is defined as
a) stalling speed or minimum steady flight speed at which the aeroplane is controllable.
b) safety speed for take-off in case of a contaminated runway.
c) design stress speed.
d) speed for best specific range.

32.1.1.0 (1735)
The stalling speed or the minimum steady flight speed at which the aeroplane is controllable in landing configuration is abbreviated as
a) VSO.
b) VS1.
c) VS.
d) VMC.

32.1.1.0 (1736)
In unaccelerated climb
a) thrust equals drag plus the downhill component of the gross weight in the flight path direction.
b) lift is greater than the gross weight.
c) lift equals weight plus the vertical component of the drag.
d) thrust equals drag plus the uphill component of the gross weight in the flight path direction.

32.1.1.0 (1737)
Which of the equations below expresses approximately the unaccelerated percentage climb gradient for small climb angles?
a) Climb Gradient = ((Thrust - Drag)/Weight) x 100
b) Climb Gradient = ((Thrust + Drag)/Lift) x 100
c) Climb Gradient = ((Thrust - Mass)/Lift) x 100
d) Cimb Gradient = (Lift/Weight) x 100

32.1.1.0 (1738)
The rate of climb
a) is approximately climb gradient times true airspeed divided by 100.
b) is the downhill component of the true airspeed.
c) is angle of climb times true airspeed.
d) is the horizontal component of the true airspeed.

32.1.1.0 (1739)
Any acceleration in climb, with a constant power setting,
a) decreases the rate of climb and the angle of climb.
b) improves the climb gradient if the airspeed is below VX.
c) improves the rate of climb if the airspeed is below VY.
d) decreases rate of climb and increses angle of climb.

32.1.1.0 (1740)
Which force compensates the weight in unaccelerated straight and level flight ?
a) the lift
b) the thrust
c) the drag
d) the resultant from lift and drag

32.1.1.0 (1741)
In which of the flight conditions listed below is the thrust required (Tr) equal to the drag (D)?
a) In level flight with constant IAS
b) In accelerated level flight

c) In a climb with constant IAS
d) In a descent with constant TAS

32.1.1.0 (1742)
The load factor in a turn in level flight with constant TAS depends on
a) the bank angle only.
b) the radius of the turn and the bank angle.
c) the true airspeed and the bank angle.
d) the radius of the turn and the weight of the aeroplane.

32.1.1.0 (1743)
The induced drag of an aeroplane
a) decreases with increasing airspeed.
b) decreases with increasing gross weight.
c) is independent of the airspeed.
d) increases with increasing airspeed.

32.1.1.0 (1744)
The induced drag of an aeroplane at constant gross weight and altitude is highest at
a) VSO (stalling speed in landing configuration)
b) VS1 (stalling speed in clean configuration)
c) VMO (maximum operating limit speed)
d) VA (design manoeuvring speed)

32.1.1.0 (1745)
What is the most important aspect of the 'backside of the power curve'?
a) The speed is unstable.
b) The aeroplane will not stall.
c) The altitude cannot be maintained.
d) The elevator must be pulled to lower the nose.

32.1.2.0 (1746)
Take-off performance data, for the ambient conditions, show the following limitations with flap 10° selected:- runway limit: 5 270 kg- obstacle limit: 4 630 kgEstimated take-off mass is 5 000kg.Considering a take-off with flaps at:
a) 5°, the obstacle limit is increased but the runway limit decreases
b) 5°, both limitations are increased
c) 20°, the obstacle limit is increased but the runway limit decreases
d) 20°, both limitations are increased

32.1.2.1 (1747)
An increase in atmospheric pressure has, among other things, the following consequences on landing performance:
a) a reduced landing distance and improved go-around performance
b) an increased landing distance and degraded go-around performance
c) an increased landing distance and improved go-around performance
d) a reduced landing distance and degraded go around performance

32.1.2.1 (1748)
How does the thrust of fixed propeller vary during take-off run ? The thrust
a) decreases slightly while the aeroplane speed builds up.
b) increases slightly while the aeroplane speed builds up.
c) varies with mass changes only.
d) has no change during take-off and climb.

32.1.2.1 (1749)
A decrease in atmospheric pressure has, among other things, the following consequences on take-off performance:
a) an increased take-off distance and degraded initial climb performance
b) a reduced take-off distance and improved initial climb performance
c) an increased take-off distance and improved initial climb performance
d) a reduced take-off distance and degraded initial climb performance

32.1.2.1 (1750)
An increase in atmospheric pressure has, among other things, the following consequences on take-off performance:
a) a reduced take-off distance and improved initial climb performance
b) an increases take-off distance and degraded initial climb performance
c) an increased take-off distance and improved initial climb performance
d) a reduced take-off distance and degraded initial climb performance

32.1.2.2 (1751)
(For this question use annex 032-2219A or Performance Manual SEP1 1 Figure 2.4)With regard to the graph for landing performance, what is the minimum headwind component required in order to land at Helgoland airport?Given:Runway length: 1300 ftRunway elevation: MSLWeather: assume ISA conditionsMass: 3200 lbsObstacle height: 50 ft
a) 10 kt.
b) No wind.
c) 5 kt.
d) 15 kt.

32.1.2.2 (1752)
(For this question use annex 032-6590A or Performance Manual SEP 1 Figure 2.4)Using the Landing Diagramm, for single engine aeroplane, determine the landing distance (from a screen height of 50 ft) required, in the following conditions: Given : Pressure altitude: 4000 ftO.A.T.: 5°CAeroplane mass: 3530 lbsHeadwind component: 15 ktFlaps: Approach settingRunway: tarred and dryLanding gear: down
a) 1400 ft
b) 880 ft
c) 1550 ft
d) 1020 ft

32.1.2.2 (1753)
(For this question use annex 032-6569A or Performance Manual SEP 1 Figure 2.4)With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft .Given :O.A.T : 27 °CPressure Altitude: 3000 ftAeroplane Mass: 2900 lbsTailwind component: 5 ktFlaps: Landing position

(down) Runway: Tarred and Dry
a) approximately : 1850 feet
b) approximately : 1120 feet
c) approximately : 1700 feet
d) approximately : 1370 feet

32.1.2.2 (1754)
(For this question use annex 032-6570A or Performance Manual SEP 1 Figure 2.4)With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft .Given :O.A.T : ISA +15°CPressure Altitude: 0 ftAeroplane Mass: 2940 lbsTailwind component: 10 ktFlaps: Landing position (down) Runway: Tarred and Dry
a) approximately : 1300 feet
b) approximately : 950 feet
c) approximately : 1400 feet
d) approximately : 750 feet

32.1.2.2 (1755)
(For this question use annex 032-6571A or Performance Manual SEP 1 Figure 2.4)With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft .Given :O.A.T : ISAPressure Altitude: 1000 ftAeroplane Mass: 3500 lbsTailwind component: 5 ktFlaps: Landing position (down) Runway: Tarred and Dry
a) approximately : 1700 feet
b) approximately :1150 feet
c) approximately : 1500 feet
d) approximately : 920 feet

32.1.2.2 (1756)
(For this question use annex 032-6572A or Performance Manual SEP 1 Figure 2.4)With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft .Given :O.A.T : 0°CPressure Altitude: 1000 ftAeroplane Mass: 3500 lbsTailwind component: 5 ktFlaps: Landing position (down) Runway: Tarred and Dry
a) approximately : 1650 feet
b) approximately : 1150 feet
c) approximately : 1480 feet
d) approximately : 940 feet

32.1.2.2 (1757)
(For this question use annex 032-6573A or Performance Manual SEP 1 Figure 2.4)With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft .Given :O.A.T : ISA +15°CPressure Altitude: 0 ftAeroplane Mass: 2940 lbsHeadwind component: 10 ktFlaps: Landing position (down) Runway: short and wet grass- firm soilCorrection factor (wet grass): 1.38
a) approximately :1794 feet
b) approximately : 1300 feet
c) approximately : 2000 feet
d) approximately : 1450 feet

32.1.2.2 (1758)
(For this question use annex 032-6574A or Performance Manual SEP 1 Figure 2.1)With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft .Given :O.A.T : 30°CPressure Altitude: 1000 ftAeroplane Mass: 3450 lbsTailwind component: 2.5 ktFlaps: up Runway: Tarred and Dry
a) approximately : 2470 feet
b) approximately : 1440 feet
c) approximately : 2800 feet
d) approximately : 2200 feet

32.1.2.2 (1759)
(For this question use annex 032-6575A or Performance Manual SEP 1 Figure 2.1)With regard to the take off performance chart for the single engine aeroplane determine the maximum allowable take off mass .Given :O.A.T : ISAPressure Altitude: 4000 ftHeadwind component: 5 ktFlaps: up Runway: Tarred and DryFactored runway length: 2000 ftObstacle height: 50 ft
a) 3240 lbs
b) 3000 lbs
c) 2900 lbs
d) > 3650 lbs

32.1.2.2 (1760)
(For this question use annex 032-6576A or Performance Manual SEP 1 Figure 2.2)With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft.Given :O.A.T : -7°CPressure Altitude: 7000 ftAeroplane Mass: 2950 lbsHeadwind component: 5 ktFlaps: Approach settingRunway: Tarred and Dry
a) approximately : 2050 ft
b) approximately : 1150 ft
c) approximately : 2450 ft
d) approximately : 1260 ft

32.1.2.2 (1761)
(For this question use annex 032-6577A or Performance Manual SEP 1 Figure 2.1)With regard to the take off performance chart for the single engine aeroplane determine the take off speed for (1) rotation and (2) at a height of 50 ft.Given :O.A.T : ISA+10°CPressure Altitude: 5000 ftAeroplane mass: 3400 lbsHeadwind component: 5 ktFlaps: up Runway: Tarred and Dry
a) 71 and 82 KIAS
b) 73 and 84 KIAS
c) 68 and 78 KIAS
d) 65 and 75 KIAS

32.1.2.2 (1762)
(For this question use annex 032-6578A or Performance Manual SEP 1 Figure 2.2)With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft.Given :O.A.T : 38°CPressure Altitude: 4000 ftAeroplane Mass: 3400 lbsTailwind component: 5 ktFlaps: Approach settingRunway: Dry GrassCorrection factor: 1.2
a) approximately : 3960 ft
b) approximately : 3680 ft

c) approximately : 4200 ft
d) approximately : 5040 ft

32.1.2.2 (1763)
(For this question use annex 032-6580A or Performance Manual SEP 1 Figure 2.2)With regard to the take off performance chart for the single engine aeroplane determine the take off distance over a 50 ft obstacle height.Given :O.A.T : 30°CPressure Altitude: 1000 ftAeroplane Mass: 2950 lbsTailwind component: 5 ktFlaps: Approach settingRunway: Short, wet grass, firm subsoilCorrection factor: 1.25 (for runway conditions)
a) 2375 ft
b) 1900 ft
c) 1600 ft
d) 2000 ft

32.1.3.0 (1764)
Assuming that the required lift exists, which forces determine an aeroplane's angle of climb?
a) Weight, drag and thrust.
b) Weight and drag only.
c) Thrust and drag only.
d) Weight and thrust only.

32.1.3.0 (1765)
How does the best angle of climb and best rate of climb vary with increasing altitude?
a) Both decrease.
b) Both increase.
c) Best angle of climb increases while best rate of climb decreases.
d) Best angle of climb decreases while best rate of climb increases.

32.1.3.0 (1766)
The 'climb gradient' is defined as the ratio of
a) the increase of altitude to horizontal air distance expressed as a percentage.
b) the increase of altitude to distance over ground expressed as a percentage.
c) true airspeed to rate of climb.
d) rate of climb to true airspeed.

32.1.3.0 (1767)
A higher outside air temperature
a) reduces the angle and the rate of climb.
b) increases the angle of climb but decreases the rate of climb.
c) does not have any noticeable effect on climb performance.
d) reduces the angle of climb but increases the rate of climb.

32.1.3.0 (1768)
A headwind component increasing with altitude, as compared to zero wind condition, (assuming IAS is constant)
a) has no effect on rate of climb.
b) does not have any effect on the angle of flight path during climb.
c) improves angle and rate of climb.
d) decreases angle and rate of climb.

32.1.3.0 (1769)
A constant headwind
a) increases the angle of the descent flight path.
b) increases the angle of descent.
c) increases the rate of descent.
d) increases the descent distance over ground.

32.1.3.0 (1770)
A constant headwind component
a) increases the angle of flight path during climb.
b) increases the best rate of climb.
c) decreases the angle of climb.
d) increases the maximum endurance.

32.1.3.1 (1771)
(For this question use annex 032-11661A or Performance Manual SEP 1 Figure 2.1)An extract of the flight manual of a single engine propeller aircraft is reproduced in annex.Airport characteristics: hard, dry and zero slope runwayActual conditions are:pressure altitude: 1 500 ftoutside tempereature: +18°Cwind component: 4 knots tailwindFor a take-off mass of 1 270 kg, the take-off distance will be:
a) 525 m
b) 415 m
c) 440 m
d) 615 m

32.1.3.1 (1772)
(For this question use annex 032-6587A or Flight planning Manual SEP 1 Figure 2.4) Using the Range Profile Diagramm, for the single engine aeroplane, determine the range, with 45 minutes reserve, in the following conditions: Given :O.A.T.: ISA +16°CPressure altitude: 4000 ftPower: Full throttle / 25,0 in/Hg./ 2100 RPM
a) 865 NM
b) 739 NM
c) 851 NM
d) 911 NM

32.1.3.1 (1773)
(For this question use annex 032-6588A or Flight planning Manual SEP 1 Figure 2.4) Using the Range Profile Diagramm, for the single engine aeroplane, determine the range, with 45 minutes reserve, in the following conditions:Given :O.A.T.: ISA -15°C Pressure altitude: 12000 ftPower: Full throttle / 23,0 in/Hg./ 2300 RPM
a) 902 NM
b) 875 NM
c) 860 NM
d) 908 NM

32.1.3.1 (1774)
(For this question use annex 032-6579A or Performance Manual SEP 1 Figure

2.3)With regard to the climb performance chart for the single engine aeroplane determine the climb speed (ft/min).Given :O.A.T : ISA + 15°CPressure Altitude: 0 ftAeroplane Mass: 3400 lbsFlaps: upSpeed: 100 KIAS
a) 1290 ft/min
b) 1370 ft/min
c) 1210 ft/min
d) 1150 ft/min

32.1.3.1 (1775)
(For this question use annex 032-6581A or Performance Manual SEP 1 Figure 2.3)Using the climb performance chart, for the single engine aeroplane, determine the ground distance to reach a height of 2000 ft above the reference zero inthe following conditions:Given :O.A.T. at take-off: 25°CAirport pressure altitude: 1000 ftAeroplane mass: 3600 lbsSpeed: 100 KIASWind component: 15 kts Headwind
a) 18 347 ft
b) 21 505 ft
c) 24 637 ft
d) 18 832 ft

32.1.3.1 (1776)
(For this question use annex 032-6582A or Performance Manual SEP 1 Figure 2.3)Using the climb performance chart, for the single engine aeroplane, determine the ground distance to reach a height of 1500 ft above the reference zero inthe following conditions:Given : O.A.T at Take-off: ISAAirport pressure altitude: 5000 ftAeroplane mass: 3300 lbsSpeed: 100 KIASWind component: 5 kts Tailwind
a) 16 665 ft
b) 18 909 ft
c) 18 073 ft
d) 20 109 ft

32.1.3.1 (1777)
(For this question use annex 032-6583A or Performance Manual SEP 1 Figure 2.3)Using the climb performance chart, for the single engine aeroplane, determine the rate of climb and the gradient of climb in the following conditions:Given : O.A.T at Take-off: ISAAirport pressure altitude: 3000 ftAeroplane mass: 3450 lbsSpeed: 100 KIAS
a) 1120 ft/min and 9,3%
b) 1030 ft/min and 8,4%
c) 1170 ft/min and 9,9%
d) 1310 ft/min and 11,3%

32.1.3.1 (1778)
(For this question use annex 032-6584A or Flight Planning Manual SEP 1 Figure 2.2 Table 2.2.3)Using the Power Setting Table, for the single engine aeroplane, determine the manifold pressure and fuel flow (lbs/hr) with full throttle and cruise lean mixture in the following conditions:Given:OAT: 13°CPressure altitude: 8000 ftRPM: 2300
a) 22,4 in.Hg and 69,3 lbs/hr
b) 23,0 in.Hg and 69,0 lbs/hr
c) 22,4 in.Hg and 71,1 lbs/hr
d) 22,4 in.Hg and 73,8 lbs/hr

32.1.3.1 (1779)
(For this question use annex 032-6585A or Flight planning Manual SEP 1 Figure 2.2 Table 2.2.3)Using the Power Setting Table, for the single engine aeroplane, determine the cruise TAS and fuel flow (lbs/hr) with full throttle and cruise lean mixture in the following conditions:Given:OAT: 13°CPressure altitude: 8000 ftRPM: 2300
a) 160 kt and 69,3 lbs/hr
b) 158 kt and 74,4 lbs/hr
c) 160 kt and 71,1 lbs/hr
d) 159 kt and 71,7 lbs/hr

32.1.3.1 (1780)
(For this question use annex 032-6586A or Flight planning Manual SEP 1 Figure 2.3 Table 2.3.1)Using the Power Setting Table, for the single engine aeroplane, determine the cruise TAS and fuel flow (lbs/hr) with full throttle and cruise lean mixture in the following conditions:Given :OAT: 3°CPressure altitude: 6000 ftPower: Full throttle / 21,0 in/Hg./ 2100 RPM
a) 134 kt and 55,7 lbs/hr
b) 136 kt and 56,9 lbs/hr
c) 131 kt and 56,9 lbs/hr
d) 125 kt and 55,7 lbs/hr

32.1.3.2 (1781)
With regard to a unaccelerated horizontal flight, which of the following statement is correct?
a) The minimum drag is proportional to the aircraft mass.
b) The minimum drag is a function of the pressure altitude.
c) The minimum drag is is a function of the density altitude.
d) The minimum drag is independant of the aircraft mass.

32.1.3.2 (1782)
Which of the following statements is correct?If the aircraft mass, in a horizontal unaccelerated flight, decreases
a) the minimum drag decreases and the IAS for minimum drag decreases.
b) the minimum drag increases and the IAS for minimum drag decreases.
c) the minimum drag increases and the IAS for minimum drag increases.
d) the minimum drag decreases and the IAS for minimum drag increases.

32.1.3.2 (1783)
(For this question use annex 032-2211A)Which of the following diagrams correctly shows the movement of the power required curve with increasing altitude .(H1 < H2)
a) Figure d
b) Figure b
c) Figure c
d) Figure a

32.1.3.2 (1784)
The maximum indicated air speed of a piston engined aeroplane, in level flight, is reached:
a) at the lowest possible altitude.

b) at the optimum cruise altitude.
c) at the service ceiling.
d) at the practical ceiling.

32.1.3.2 (1785)
The pilot of a single engine aircraft has established the climb performance. The carriage of an additional passenger will cause the climb performance to be:
a) Degraded
b) Improved
c) Unchanged
d) Unchanged, if a short field take-off is adopted

32.1.3.3 (1786)
What affect has a tailwind on the maximum endurance speed?
a) No affect
b) Tailwind only effects holding speed.
c) The IAS will be increased.
d) The IAS will be decreased.

32.2.1.0 (1787)
At a given mass, the stalling speed of a twin engine aircraft is 100 kt in the landing configuration. The minimum speed a pilot must maintain in short final is:
a) 130 kt
b) 115 kt
c) 125 kt
d) 120 kt

32.2.1.1 (1788)
The critical engine inoperative
a) increases the power required because of the greater drag caused by the windmilling engine and the compensation for the yaw effect.
b) does not affect the aeroplane performance since it is independent of the power plant.
c) decreases the power required because of the lower drag caused by the windmilling engine.
d) increases the power required and decreases the total drag due to the windmilling engine.

32.2.1.1 (1789)
A multi engine aeroplane is flying at the minimum control speed (VMCA). Which parameter(s) must be maintainable after engine failure?
a) Straight flight
b) Straight flight and altitude
c) Heading, altitude and a positive rate of climb of 100 ft/min
d) Altitude

32.2.1.1 (1790)
The speed V1 is defined as
a) take-off decision speed.
b) take-off climb speed.
c) speed for best angle of climb.
d) engine failure speed.

32.2.1.1 (1791)
The speed VLO is defined as
a) landing gear operating speed.
b) design low operating speed.
c) long distance operating speed.
d) lift off speed.

32.2.1.1 (1792)
VX is
a) the speed for best angle of climb.
b) the speed for best rate of climb.
c) the speed for best specific range.
d) the speed for best angle of flight path.

32.2.1.1 (1793)
The speed for best rate of climb is called
a) VY.
b) VX.
c) V2.
d) VO.

32.2.2.1 (1794)
Which of the following speeds can be limited by the 'maximum tyre speed'?
a) Lift-off groundspeed.
b) Lift-off IAS.
c) Lift-off TAS.
d) Lift-off EAS.

32.2.2.1 (1795)
Changing the take-off flap setting from flap 15° to flap 5° will normally result in :
a) a longer take-off distance and a better climb.
b) a shorter take-off distance and an equal climb.
c) a better climb and an equal take-off distance.
d) a shorter take-off distance and a better climb.

32.2.2.1 (1796)
If other factors are unchanged, the fuel mileage (nautical miles per kg) is
a) lower with a forward centre of gravity position.
b) independent from the centre of gravity position.
c) lower with an aft centre of gravity position.
d) higher with a forward centre of gravity position.

32.2.2.1 (1797)
The result of a higher flap setting up to the optimum at take-off is
a) a shorter ground roll.
b) an increased acceleration.
c) a higher V1.
d) a longer take-off run.

32.2.2.2 (1798)
Which of the following combinations adversely affects take-off and initial climb performance ?
a) High temperature and high relative humidity
b) Low temperature and high relative humidity
c) High temperature and low relative humidity
d) Low temperature and low relative humidity

32.2.2.2 (1799)
What effect has a downhill slope on the take-off speeds? The slope
a) decreases the take-off speed V1.
b) decreases the TAS for take-off.
c) increases the IAS for take-off.
d) has no effect on the take-off speed V1.

32.2.2.2 (1800)
The effect of a higher take-off flap setting up to the optimum is:
a) an increase of the field length limited take-off mass but a decrease of the climb limited take-off mass.
b) a decrease of the field length limited take-off mass but an increase of the climb limited take-off mass.
c) a decrease of both the field length limited take-off mass and the climb limited take-off mass.
d) an increase of both the field length limited take-off mass and the climb limited take-off mass.

32.2.2.2 (1801)
When the outside air temperature increases, then
a) the field length limited take-off mass and the climb limited take-off mass decreases.
b) the field length limited take-off mass and the climb limited take-off mass increases.
c) the field length limited take-off mass decreases but the climb limited take-off mass increases.
d) the field length limited take-off mass increases but the climb limited take-off mass decreases.

32.2.2.2 (1802)
Due to standing water on the runway the field length limited take-off mass will be
a) lower.
b) higher.
c) unaffected.
d) only higher for three and four engine aeroplanes.

32.2.2.2 (1803)
On a dry runway the accelerate stop distance is increased
a) by uphill slope.
b) by headwind.
c) by low outside air temperature.
d) by a lower take-off mass because the aeroplane accelerates faster to V1.

32.2.2.2 (1804)
Which of the following are to be taken into account for the runway in use for take-off ?
a) Airport elevation, runway slope, outside air temperature, pressure altitude and wind components.
b) Airport elevation, runway slope, standard temperature, standard pressure and wind components.
c) Airport elevation, runway slope, standard temperature, pressure altitude and wind components.
d) Airport elevation, runway slope, outside air temperature, standard pressure and wind components.

32.2.2.2 (1805)
What is the effect of increased mass on the performance of a gliding aeroplane?
a) The speed for best angle of descent increases.
b) There is no effect.
c) The gliding angle decreases.
d) The lift/drag ratio decreases.

32.2.2.2 (1806)
A higher pressure altitude at ISA temperature
a) decreases the field length limited take-off mass.
b) decreases the take-off distance.
c) increases the climb limited take-off mass.
d) has no influence on the allowed take-off mass.

32.2.2.2 (1807)
The take-off distance required increases
a) due to slush on the runway.
b) due to downhill slope because of the smaller angle of attack.
c) due to head wind because of the drag augmentation.
d) due to lower gross mass at take-off.

32.2.2.2 (1808)
A runway is contaminated by a 0,5 cm layer of wet snow. The take-off is nevertheless authorized by a light-twin's flight manual. The take-off distance in relation to a dry runway will be:
a) increased
b) unchanged
c) decreased
d) very significantly decreased

32.2.2.2 (1809)
A runway is contaminated with 0.5 cm of wet snow.The flight manual of a light twin nevertheless authorises a landing in these conditions. The landing distance will be, in relation to that for a dry runway:
a) increased
b) unchanged
c) reduced
d) substantially decreased

32.2.3.0 (1810)
What is the effect of a head wind component, compared to still air, on the maximum range speed (IAS) and the speed for maximum climb angle respectively?
a) Maximum range speed increases and maximum climb angle speed stays constant.
b) Maximum range speed decreases and maximum climb angle speed increases.
c) Maximum range speed decreases and maximum climb angle speed decreases.
d) Maximum range speed increases and maximum climb angle speed increases.

32.2.3.1 (1811)
The stopway is an area which allows an increase only in :
a) the accelerate-stop distance available.
b) the take-off run available.
c) the take-off distance available.
d) the landing distance available.

32.2.3.1 (1812)
For a turboprop powered aeroplane, a 2200 m long runway at the destination aerodrome is expected to be ""wet"". The ""dry runway"" landing distance, should not exceed:
a) 1339 m.
b) 1771 m.
c) 1540 m.
d) 1147 m.

32.2.3.1 (1813)
Which of the following factors favours the selection of a low flap setting for the take-off?
a) High field elevation, distant obstacles in the climb-out path, long runway and a high ambient temperature.
b) Low field elevation, close-in obstacles in the climb-out path, long runway and a high ambient temperature.
c) High field elevation, no obstacles in the climb-out path, low ambient temperature and short runway.
d) Low field elevation, no obstacles in the climb-out path, short runway and a low ambient temperature.

32.2.3.1 (1814)
Field length is balanced when
a) take-off distance equals accelerate-stop distance.
b) calculated V2 is less than 110% VMCA and V1, VR, VMCG.
c) all engine acceleration to V1 and braking distance for rejected take-off are equal.
d) one engine acceleration from V1 to VLOF plus flare distance between VLOF and 35 feet are equal.

32.2.3.1 (1815)
What is the advantage of a balanced field length condition ?
a) A balanced field length gives the minimum required field length in the event of an engine failure.
b) A balanced take-off provides the lowest elevator input force requirement for rotation.
c) For a balanced field length the required take-off runway length always equals the available runway length.
d) A balanced field length provides the greatest margin between ""net"" and ""gross"" take-off flight paths.

32.2.3.1 (1816)
The take-off distance of an aircraft is 600m in standard atmosphere, no wind at 0 ft pressure-altitude.Using the following corrections: ""± 20 m / 1 000 ft field elevation"" ""- 5 m / kt headwind"" ""+ 10 m / kt tail wind"" ""± 15 m / % runway slope"" ""± 5 m / °C deviation from standard temperature""The take-off distance from an airport at 1 000 ft elevation, temperature 17°C, QNH 1013,25 hPa, 1% up-slope, 10 kt tail wind is:
a) 755 m
b) 715 m
c) 555 m
d) 685 m

32.2.3.1 (1817)
An aircraft has two certified landing flaps positions, 25° and 35°.If a pilot chooses 35° instead of 25°, the aircraft will have:
a) a reduced landing distance and degraded go-around performance
b) a reduced landing distance and better go-around performance
c) an increased landing distance and degraded go-around performance
d) an increased landing distance and better go-around performance

32.2.3.1 (1818)
Following a take-off, limited by the 50 ft screen height, a light twin climbs on a gradient of 5%.It will clear a 160 m obstacle in relation to the runway (horizontally), situated at 5 000 m from the 50 ft point with an obstacle clearance margin of:
a) 105 m
b) 90 m
c) 75 m
d) it will not clear the obstacle

32.2.3.1 (1819)
If the airworthiness documents do not specify a correction for landing on a wet runway, the landing distance must be increased by:
a) 15%
b) 5%
c) 10%
d) 20%

32.2.3.1 (1820)
Following a take-off determined by the 50ft (15m) screen height, a light twin climbs on a 10% over-the-ground climb gradient.It will clear a 900 m high obstacle in relation to the runway (horizontally), situated at 10 000 m from the 50 ft clearing point with an obstacle clearance of:
a) 115 m
b) 100 m
c) 85 m
d) It will not clear the obstacle

32.2.3.1 (1821)
An aircraft has two certified landing flaps positions, 25° and 35°.If a pilot chooses 25° instead of 35°, the aircraft will have:
a) an increased landing distance and better go-around performance
b) a reduced landing distance and better go-around performance
c) an increased landing distance and degraded go-around performance
d) a reduced landing distance and degraded go-around performance

32.2.3.1 (1822)
The take-off distance of an aircraft is 800m in standard atmosphere, no wind at 0 ft pressure-altitude.Using the following corrections : ""± 20 m / 1 000 ft field elevation "" ""- 5 m / kt headwind "" ""+ 10 m / kt tail wind "" ""± 15 m / % runway slope "" ""± 5 m / °C deviation from standard temperature ""The take-off distance from an airport at 2 000 ft elevation, temperature 21°C, QNH 1013.25 hPa, 2% up-slope, 5 kt tail wind is :
a) 970 m
b) 890 m
c) 870 m
d) 810 m

32.2.3.2 (1823)
During climb to the cruising level, a headwind component
a) decreases the ground distance flown during that climb.
b) increases the amount of fuel for the climb.
c) increases the climb time.
d) decreases the climb time.

32.2.3.2 (1824)
The angle of climb with flaps extended, compared to that with flaps retracted, will normally be:
a) Smaller.
b) Larger.
c) Not change.
d) Increase at moderate flap setting, decrease at large flap setting.

32.2.3.2 (1825)
Which of the following combinations basically has an effect on the angle of descent in a glide?(Ignore compressibility effects.)
a) Configuration and angle of attack.
b) Mass and altitude.
c) Altitude and configuration.
d) Configuration and mass.

32.2.3.2 (1826)
Two identical aeroplanes at different masses are descending at idle thrust. Which of the following statements correctly describes their descent characteristics ?
a) At a given angle of attack, both the vertical and the forward speed are greater for the heavier aeroplane.
b) There is no difference between the descent characteristics of the two aeroplanes.
c) At a given angle of attack the heavier aeroplane will always glide further than the lighter aeroplane.
d) At a given angle of attack the lighter aeroplane will always glide further than the heavier aeroplane.

32.2.3.2 (1827)
When flying the ""Backside of Thrustcurve"" means
a) a lower airspeed requires more thrust.
b) the thrust required is independent of the airspeed.
c) a thrust reduction results in an acceleration of the aeroplane.
d) a lower airspeed requires less thrust because drag is decreased.

32.2.3.2 (1828)
In a steady descending flight (descent angle GAMMA) equilibrium of forces acting on the aeroplane is given by:(T = Thrust, D = Drag, W = Weight)
a) T + W sin GAMMA = D
b) T - W sin GAMMA = D
c) T - D = W sin GAMMA
d) T + D = - W sin GAMMA

32.2.3.2 (1829)
An aeroplane executes a steady glide at the speed for minimum glide angle. If the forward speed is kept constant, what is the effect of a lower mass? Rate of descent / Glide angle / CL/CD ratio
a) increases / increases / decreases
b) decreases / constant / decreases
c) increases / increases / constant
d) increases / constant / increases

32.2.3.2 (1830)
An aeroplane is in a power off glide at best gliding speed. If the pilot increases pitch attitude the glide distance:
a) decreases.
b) increases.
c) remains the same.
d) may increase or decrease depending on the aeroplane.

32.2.3.2 (1831)
Which of the following provides maximum obstacle clearance during climb?
a) The speed for maximum climb angle Vx.
b) 1.2Vs.
c) The speed for maximum rate of climb.
d) The speed, at which the flaps may be selected one position further UP.

32.2.3.2 (1832)
Which of the following factors will lead to an increase of ground distance during a glide, while maintaining the appropriate minimum glide angle speed?
a) Tailwind.
b) Increase of aircraft mass.
c) Decrease of aircraft mass.
d) Headwind.

32.2.3.2 (1833)
Which of the following factors leads to the maximum flight time of a glide?
a) Low mass.
b) High mass.
c) Headwind.
d) Tailwind.

32.2.3.2 (1834)
What is the influence of the mass on maximum rate of climb (ROC) speed if all other parameters remain constant ?
a) The ROC speed increases with increasing mass.
b) The ROC speed decreases with increasing mass.
c) The ROC is affected by the mass, but not the ROC speed.
d) The ROC and the ROC speed are independant of the mass.

32.2.3.2 (1835)
(For this question use annex 032-4744A)Considering a rate of climb diagram (ROC versus TAS) for an aeroplane. Which of the diagrams shows the correct curves for ""flaps down"" compared to ""clean"" configuration?
a) a
b) b
c) c
d) d

32.2.3.2 (1836)
With an true airspeed of 194 kt and a vertical speed of 1 000 ft/min, the climb gradient is about :
a) 3°
b) 3%
c) 5°
d) 8%

32.2.3.2 (1837)
On a twin engined piston aircraft with variable pitch propellers, for a given mass and altitude, the minimum drag speed is 125 kt and the holding speed (minimum fuel burn per hour) is 95 kt.The best rate of climb speed will be obtained for a speed:
a) equal to 95 kt
b) inferior to 95 kts
c) is between 95 and 125 kt
d) equal to 125 kt

32.2.3.2 (1838)
A climb gradient required is 3,3%. For an aircraft maintaining 100 kt true airspeed , no wind, this climb gradient corresponds to a rate of climb of approximately:
a) 330 ft/min
b) 3 300 ft/min
c) 3,30 m/s
d) 33,0 m/s

32.2.3.2 (1839)
The climb gradient of an aircraft after take-off is 6% in standard atmosphere, no wind, at 0 ft pressure altitude.Using the following corrections: ""± 0,2 % / 1 000 ft field elevation"" ""± 0,1 % / °C from standard temperature"" "" - 1 % with wing anti-ice"" "" - 0,5% with engine anti-ice""The climb gradient after take-off from an airport situated at 1 000 ft, 17° C, QNH 1013,25 hPa, with wing and engine anti-ice operating for a functional check is :
a) 3,90%
b) 4,30%
c) 4,70%
d) 4,90%

32.2.3.3 (1840)
During climb with all engines, the altitude where the rate of climb reduces to 100 ft/min is called:
a) Service ceiling
b) Absolute ceiling
c) Thrust ceiling
d) Maximum transfer ceiling

32.2.3.3 (1841)
The maximum rate of climb that can be maintained at the absolute ceiling is:
a) 0 ft/min
b) 125 ft/min
c) 500 ft/min
d) 100 ft/min

32.2.3.3 (1842)
Considering TAS for maximum range and maximum endurance, other factors remaining constant,
a) both will increase with increasing altitude.
b) both will decrease with increasing altitude.
c) both will stay constant regardless of altitude.
d) TAS for maximum range will increase with increased altitude while TAS for maximum endurance will decrease with increased altitude.

32.2.3.3 (1843)
A twin engined aeroplane in cruise flight with one engine inoperative has to fly over high ground. In order to maintain the highest possible altitude the pilot should choose:
a) the speed corresponding to the maximum value of the lift / drag ratio.
b) the long range speed.
c) the speed corresponding to the minimum value of (lift / drag)^3/2.
d) the speed at the maximum lift.

32.2.3.3 (1844)
The maximum horizontal speed occurs when:
a) The maximum thrust is equal to the total drag.
b) The thrust is equal to the maximum drag.
c) The thrust is equal to minimum drag.
d) The thrust does not increase further with increasing speed.

32.2.3.3 (1845)
With respect to the optimum altitude, which of the following statements is correct ?
a) An aeroplane sometimes flies above or below the optimum altitude because optimum altitude increases continuously during flight.
b) An aeroplane always flies below the optimum altitude, because Mach buffet might occur.
c) An aeroplane always flies at the optimum altitude because this is economically seen as the most attractive altitude.
d) An aeroplane flies most of the time above the optimum altitude because this yields the most economic result.

32.2.3.3 (1846)
How does the lift coefficient for maximum range vary with altitude?(No compressibility effects.)
a) The lift coefficient is independant of altitude.
b) The lift coefficient decreases with increasing altitude.
c) The lift coefficient increases with increasing altitude.
d) Only at low speeds the lift coefficient decreases with increasing altitude.

32.2.3.3 (1847)
The optimum altitude
a) increases as mass decreases and is the altitude at which the specific range reaches its maximum.
b) decreases as mass decreases.
c) is the altitude at which the specific range reaches its minimum.
d) is the altitude up to which cabin pressure of 8 000 ft can be maintained.

32.2.3.3 (1848)
To achieve the maximum range over ground with headwind the airspeed should be
a) higher compared to the speed for maximum range cruise with no wind.
b) equal to the speed for maximum range cruise with no wind.
c) lower compared to the speed for maximum range cruise with no wind.
d) reduced to the gust penetration speed.

32.2.3.3 (1849)
The absolute ceiling
a) is the altitude at which the rate of climb theoretically is zero.
b) can be reached only with minimim steady flight speed
c) is the altitude at which the best climb gradient attainable is 5%
d) is the altitude at which the aeroplane reaches a maximum rate of climb of 100 ft/min.

32.2.3.3 (1850)
The pilot of a light twin engine aircraft has calculated a 4 000 m service ceiling, based on the forecast general conditions for the flight and a take-off mass of 3 250 kg.If the take-off mass is 3 000 kg, the service ceiling will be:
a) higher than 4 000 m.
b) less than 4 000 m.
c) unchanged, equal to 4 000 m.
d) only a new performance analysis will determine if the service ceiling is higher or lower than 4 000 m.

32.2.3.4 (1851)
Which statement regarding the relationship between traffic load and range is correct?
a) The traffic load can be limited by the desired range.
b) The maximum zero fuel mass limits the maximum quantity of fuel.
c) The maximum landing mass is basically equal to the maximum zero fuel mass.
d) The maximum traffic load is not limited by the reserve fuel quantity.

32.2.3.5 (1852)
The speed for maximum lift/drag ratio will result in :
a) The maximum range for a propeller driven aeroplane.
b) The maximum range for a jet aeroplane.
c) The maximum endurance for a propeller driven aeroplane.
d) The maximum angle of climb for a propeller driven aeroplane.

32.2.3.5 (1853)
Maximum endurance for a piston engined aeroplane is achieved at:
a) The speed that approximately corresponds to the maximum rate of climb speed.
b) The speed for maximum lift coefficient.
c) The speed for minimum drag.
d) The speed that corresponds to the speed for maximum climb angle.

32.2.3.5 (1854)
(For this question use annex 032-2929A)Consider the graphic representation of the power required versus true air speed (TAS), for a piston engined aeroplane with a given mass. When drawing the tangent from the origin, the point of contact (A) determines the speed of:
a) maximum specific range.
b) maximum endurance.
c) maximum thrust.
d) critical angle of attack.

32.2.3.5 (1855)
For a piston engined aeroplane, the speed for maximum range is :
a) that which gives the maximum lift to drag ratio.
b) that which givesthe minimum value of drag.
c) that which givesthe maximun value of lift
d) 1.4 times the stall speed in clean configuration.

32.2.3.5 (1856)
The flight manual of a light twin engine recommends two cruise power settings, 65 and 75 %. The 75% power setting in relation to the 65 % results in:
a) an increase in speed, fuel consumption and fuel-burn/distance.
b) same speed and an increase of the fuel-burn per hour and fuel-burn/distance.
c) an increase in speed and fuel-burn/distance, but an unchanged fuel-burn per hour.
d) same speed and fuel-burn/distance, but an increase in the fuel-burn per hour.

32.2.4.1 (1857)
(For this question use annex 032-4743A or Performance Manual MEP1 Figure 3.2)With regard to the graph for the light twin aeroplane, will the accelerate and stop distance be achieved in a take-off where the brakes are released before take-

off power is set?
a) No, the performance will be worse than in the chart.
b) Performance will be better than in the chart.
c) Yes, the chart has been made for this situation.
d) It does not matter which take-off technique is being used.

32.3.1.0 (1858)
Provided all other parameters stay constant. Which of the following alternatives will decrease the take-off ground run?
a) Decreased take-off mass, increased density, increased flap setting.
b) Increased pressure altitude, increased outside air temperature, increased take-off mass.
c) Increased outside air temperature, decreased pressure altitude, decreased flap setting.
d) Decreased take-off mass, increased pressure altitude, increased temperature.

32.3.1.1 (1859)
An airport has a 3000 metres long runway, and a 2000 metres clearway at each end of that runway. For the calculation of the maximum allowed take-off mass, the take-off distance available cannot be greater than:
a) 4500 metres.
b) 6000 metres.
c) 4000 metres.
d) 5000 metres.

32.3.1.1 (1860)
During the certification flight testing of a twin engine turbojet aeroplane, the real take-off distances are equal to:- 1547 m with all engines running- 1720 m with failure of critical engine at V1, with all other things remaining unchanged.The take-off distance adopted for the certification file is:
a) 1779 m.
b) 1978 m.
c) 1547 m.
d) 1720 m.

32.3.1.1 (1861)
The take-off decision speed V1 is:
a) a chosen limit. If an engine failure is recognized before reaching V1 the take-off must be aborted.
b) not less than V2min, the minimum take-off safety speed.
c) a chosen limit. If an engine failure is recognized after reaching V1 the take-off must be aborted.
d) sometimes greater than the rotation speed VR.

32.3.1.1 (1862)
Minimum control speed on ground, VMCG, is based on directional control being maintained by:
a) primary aerodynamic control only.
b) primary aerodynamic control and nosewheel.
c) primary aerodynamic control, nosewheel steering and differential braking.
d) nosewheel steering only.

32.3.1.1 (1863)
The take-off performance requirements for transport category aeroplanes are based upon:
a) failure of critical engine or all engines operating which ever gives the largest take off distance.
b) all engines operating.
c) only one engine operating.
d) failure of critical engine.

32.3.1.1 (1864)
Which of the following distances will increase if you increase V1?
a) Accelerate Stop Distance
b) Take-off distance
c) All Engine Take-off distance
d) Take-off run

32.3.1.1 (1865)
The length of a clearway may be included in:
a) the take-off distance available.
b) the accelerate-stop distance available.
c) the take-off run available.
d) the distance to reach V1.

32.3.1.1 (1866)
The one engine out take-off run is the distance between the brake release point and:
a) the middle of the segment between VLOF point and 35 ft point.
b) the lift-off point.
c) the point where V2 is reached.
d) the point half way between V1 and V2.

32.3.1.1 (1867)
What is the advantage of balancing V1, even in the event of a climb limited take-off?
a) The safety margin with respect to the runway length is greatest.
b) The take-off distance required with one engine out at V1 is the shortest.
c) The accelerate stop distance required is the shortest.
d) The climb limited take-off mass is the highest.

32.3.1.1 (1868)
Which statement is correct?
a) The climb limited take-off mass depends on pressure altitude and outer air temperature
b) The performance limited take-off mass is the highest of:field length limited take-off massclimb limited take-off massobstacle limited take-off mass.
c) The climb limited take-off mass will increase if the headwind component increases.
d) The climb limited take-off mass increases when a larger take-off flap setting is used.

32.3.1.1 (1869)
Maximum and minimum values of V1 are limited by :
a) VR and VMCG

b) V2 and VMCA
c) VR and VMCA
d) V2 and VMCG

32.3.1.1 (1870)
Take-off run is defined as the
a) horizontal distance along the take-off path from the start of the take-off to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 ft above the take-off surface.
b) distance to V1 and stop, assuming an engine failure at V1.
c) distance to 35 feet with an engine failure at V1 or 115% all engine distance to 35 feet.
d) Distance from brake release to V2.

32.3.1.1 (1871)
The minimum value of V2 must exceed ""air minimum control speed"" by:
a) 10%
b) 15%
c) 20%
d) 30%

32.3.1.1 (1872)
Which of the following statements is correct ?
a) A stopway means an area beyond the take-off runway, able to support the aeroplane during an aborted take-off.
b) An underrun is an area beyond the runway end which can be used for an aborted take-off.
c) A clearway is an area beyond the runway which can be used for an aborted take-off.
d) If a clearway or a stopway is used, the liftoff point must be attainable at least at the end of the permanent runway surface.

32.3.1.1 (1873)
The decision speed at take-off (V1) is the calibrated airspeed:
a) below which take-off must be rejected if an engine failure is recognized, above which take-off must be continued.
b) at which the take-off must be rejected.
c) below which the take-off must be continued.
d) at which the failure of the critical engine is expected to occur.

32.3.1.1 (1874)
Which of the following set of factors could lead to a V2 value which is limited by VMCA?
a) Low take-off mass, high flap setting and low field elevation.
b) Low take-off mass, low flap setting and low field elevation.
c) High take-off mass, high flap setting and low field elevation.
d) High take-off mass, low flap setting and high field elevation.

32.3.1.1 (1875)
During the flight preparation a pilot makes a mistake by selecting a V1 greater than that required. Which problem will occur when the engine fails at a speed immediatly above the correct value of V1?
a) The stop distance required will exceed the stop distance available.
b) The one engine out take-off distance required may exceed the take-off distance available.
c) V2 may be too high so that climb performance decreases.
d) It may lead to over-rotation.

32.3.1.1 (1876)
Which of the following statements is correct?
a) The climb limited take-off mass is independant of the wind component.
b) The performance limited take-off mass is independant of the wind component.
c) The accelerate stop distance required is independant of the runway condition.
d) The take-off distance with one engine out is independant of the wind component.

32.3.1.1 (1877)
Which of the following statements is correct?
a) VR is the speed at which the pilot should start to rotate the aeroplane.
b) VR should not be higher than V1.
c) VR should not be higher than 1.05 VMCG.
d) VR is the speed at which, during rotation, the nose wheel comes off the runway.

32.3.1.1 (1878)
Complete the following statement regarding the take-off performance of an aeroplane in performance class A. Following an engine failure at (i) .... and allowing for a reaction time of (ii) .... a correctly loaded aircraft must be capable of decelerating to a halt within the (iii) ....
a) (i) V1 (ii) 2 seconds (iii) Accelerate - stop distance available.
b) (i) V2 (ii) 3 seconds (iii) Take-off distance available.
c) (i) V1 (ii) 1 second (iii) Accelerate - stop distance available.
d) (i) V1 (ii) 2 seconds (iii) Take-off distance available.

32.3.1.1 (1879)
With regard to a take-off from a wet runway, which of the following statements is correct?
a) The screen height can be lowered to reduce the mass penalties.
b) When the runway is wet, the V1 reduction is sufficient to maintain the same margins on the runway length.
c) In case of a reverser inoperative the wet runway performance information can still be used.
d) Screen height cannot be reduced.

32.3.1.1 (1880)
The take-off run is
a) the horizontal distance along the take-off path from the start of the take-off to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 ft above the take-off surface.
b) 1.5 times the distance from the point of brake release to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane attains a height of 35 ft above the runway with all engines operative.
c) 1.15 times the distance from the point of brake release to the point at which VLOF is reached assuming a failure of the critical engine at V1.
d) the distance of the point of brake release to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane attains a height of 50 ft above the runway assuming a failure of the critical engine at V1.

32.3.1.1 (1881)
Can the length of a stopway be added to the runway length to determine the take-off distance available ?
a) No.
b) No, unless its centerline is on the extended centerline of the runway.
c) Yes, but the stopway must be able to carry the weight of the aeroplane.
d) Yes, but the stopway must have the same width as the runway.

32.3.1.1 (1882)
Which is the correct sequence of speeds during take-off?
a) VMCG, V1, VR, V2.
b) V1, VMCG, VR, V2.
c) V1, VR, VMCG, V2.
d) V1, VR, V2, VMCA.

32.3.1.1 (1883)
Which statement regarding V1 is correct?
a) V1 is not allowed to be greater than VR.
b) V1 is not allowed to be greater than VMCG.
c) When determining the V1, reverse thrust is only allowed to be taken into account on the remaining symmetric engines.
d) The V1 correction for up-slope is negative.

32.3.1.1 (1884)
When an aircraft takes off with the mass limited by the TODA:
a) the actual take-off mass equals the field length limited take-off mass.
b) the distance from brake release to V1 will be equal to the distance from V1 to the 35 feet point.
c) the ""balanced take-off distance"" equals 115% of the ""all engine take-off distance"".
d) the end of the runway will be cleared by 35 feet following an engine failure at V1.

32.3.1.1 (1885)
VR cannot be lower than:
a) V1 and 105% of VMCA.
b) 105% of V1 and VMCA.
c) 1.2 Vs for twin and three engine jet aeroplane.
d) 1.15 Vs for turbo-prop with three or more engines.

32.3.1.1 (1886)
V2 has to be equal to or higher than
a) 1.1 VMCA.
b) 1.15 VMCG.
c) 1.1 VSO.
d) 1.15 VR.

32.3.1.1 (1887)
V1 has to be
a) equal to or higher than VMCG.
b) equal to or higher than VMCA.
c) higher than than VR.
d) equal to or higher than V2.

32.3.1.1 (1888)
The speed VR
a) is the speed at which rotation to the lift-off angle of attack is initiated.
b) must be higher than V2.
c) must be higher than VLOF.
d) must be equal to or lower than V1.

32.3.1.1 (1889)
The speed V2 is
a) the take-off safety speed.
b) that speed at which the PIC should decide to continue or not the take-off in the case of an engine failure.
c) the lowest airspeed required to retract flaps without stall problems.
d) the lowest safety airspeed at which the aeroplane is under control with aerodynamic surfaces in the case of an engine failure.

32.3.1.1 (1890)
Which take-off speed is affected by the presence or absence of stopway and/or clearway ?
a) V1
b) V2
c) VMCG
d) VMCA

32.3.1.1 (1891)
The speed V2 is defined for jet aeroplane as
a) take-off climb speed or speed at 35 ft.
b) lift off speed.
c) take-off decision speed.
d) critical engine failure speed.

32.3.1.1 (1892)
The take-off mass could be limited by
a) the take-off distance available (TODA), the maximum brake energy and the climb gradient with one engine inoperative.
b) the maximum brake energy only.
c) the climb gradient with one engine inoperative only.
d) the take-off distance available (TODA) only.

32.3.1.1 (1893)
Which of the following is true with regard to VMCA (air minimum control speed)?
a) Straight flight can not be maintained below VMCA, when the critical engine has failed.
b) The aeroplane is uncontrollable below VMCA
c) The aeroplane will not gather the minimum required climb gradient
d) VMCA only applies to four-engine aeroplanes

32.3.1.1 (1894)
Which of the following will decrease V1?
a) Inoperative anti-skid.
b) Increased take-off mass.

c) Inoperative flight management system.
d) Increased outside air temperature.

32.3.1.1 (1895)
In case of an engine failure recognized below V1
a) the take-off must be rejected.
b) the take-off may be continued if a clearway is available.
c) the take-off should only be rejected if a stopway is available.
d) the take-off is to be continued unless V1 is less than the balanced V1.

32.3.1.1 (1896)
In case of an engine failure which is recognized at or above V1
a) the take-off must be continued.
b) the take-off must be rejected if the speed is still below VLOF.
c) a height of 50 ft must be reached within the take-off distance.
d) the take-off should be rejected if the speed is still below VR.

32.3.1.1 (1897)
The take-off distance available is
a) the length of the take-off run available plus the length of the clearway available.
b) the runway length minus stopway.
c) the runway length plus half of the clearway.
d) the total runway length, without clearway even if this one exists.

32.3.1.1 (1898)
The take-off safety speed V2min for turbo-propeller powered aeroplanes with more than three engines may not be less than:
a) 1.15 Vs
b) 1.3 Vs
c) 1.2 Vs
d) 1.2 Vs1

32.3.1.1 (1899)
The take-off safety speed V2 for two-engined or three-engined turbo propeller powered aeroplanes may not be less than:
a) 1.2 Vs
b) 1.3 Vs
c) 1.15 Vs
d) 1.15 Vs1

32.3.1.1 (1900)
Which statement regarding V1 is correct ?
a) VR may not be lower than V1
b) V1 may not be higher than Vmcg
c) When determining V1, reverse thrust may only be used on the remaining symmetric engines
d) The correction for up-slope on the balanced V1 is negative

32.3.1.2 (1901)
How does runway slope affect allowable take-off mass, assuming other factors remain constant and not limiting?
a) A downhill slope increases allowable take-off mass.
b) An uphill slope increases take-off mass.
c) Allowable take-off mass is not affected by runway slope.
d) A downhill slope decreases allowable take-off mass.

32.3.1.2 (1902)
Uphill slope
a) increases the take-off distance more than the accelerate stop distance.
b) decreases the accelerate stop distance only.
c) decreases the take-off distance only.
d) increases the allowed take-off mass.

32.3.1.2 (1903)
If the take-off mass of an aeroplane is brake energy limited a higher uphill slope would
a) increase the maximum mass for take-off.
b) decrease the maximum mass for take-off.
c) have no effect on the maximum mass for take-off.
d) decrease the required take-off distance.

32.3.1.2 (1904)
Which statement related to a take-off from a wet runway is correct?
a) A reduction of screen height is allowed in order to reduce weight penalties
b) The use of a reduced Vr is sufficient to maitain the same safety margins as for a dry runway
c) In case of a reverser inoperative the wet runway performance information can still be used
d) Screenheight reduction can not be applied because of reduction in obstacle clearance.

32.3.1.2 (1905)
Which statement regarding the influence of a runway down-slope is correct for a balanced take-off? Down-slope...
a) reduces V1 and reduces take-off distance required (TODR).
b) increases V1 and reduces the accelerate stop distance required (ASDR).
c) reduces V1 and increases the accelerate stop distance required (ASDR).
d) increases V1 and increases the take-off distance required (TODR).

32.3.1.3 (1906)
The required Take-off Distance (TOD) and the field length limited Take-off Mass (TOM) are different for the zero flap case and take-off position flap case. What is the result of flap setting in take-off position compared to zero flap position?
a) Decreased TOD required and increased field length limited TOM.
b) Increased TOD required and decreased field length limited TOM.
c) Increased TOD required and increased field length limited TOM.
d) Decreased TOD required and decreased field length limited TOM.

32.3.1.3 (1907)
The determination of the maximum mass on brake release, of a certified turbojet aeroplane with 5°, 15° and 25° flaps angles on take-off, leads to the following values, with wind:Flap angle: 5° 15° 25°Runway limitation (kg): 66 000 69 500 71 5002nd segment slope limitation: 72 200 69 000 61 800Wind correction: Head

wind:+120kg / kt Tail wind: -360kg / ktGiven that the tail wind component is equal to 5 kt, the maximum mass on brake release and corresponding flap angle will be:
a) 67 700 kg / 15 deg
b) 69 000 kg / 15 deg
c) 72 200 kg / 5 deg
d) 69 700 kg / 25 deg

32.3.1.3 (1908)
Reduced take-off thrust should normally not be used when:
a) windshear is reported on the take-off path.
b) it is dark.
c) the runway is dry.
d) the runway is wet.

32.3.1.3 (1909)
Reduced take-off thrust should normally not be used when:
a) anti skid is not usable.
b) it is dark.
c) the runway is wet.
d) the OAT is ISA +10°C

32.3.1.3 (1910)
Reduced take-off thrust should normally not be used when:
a) the runway is contaminated.
b) it is dark.
c) the runway is wet.
d) obstacles are present close to the end of the runway.

32.3.1.3 (1911)
The use of reduced take-off thrust is permitted, only if:
a) The actual take-off mass (TOM) is lower than the field length limited TOM.
b) The take-off distance available is lower than the take-off distance required one engine out at V1.
c) The actual take-off mass (TOM) including a margin is greater than the performance limited TOM.
d) The actual take-off mass (TOM) is greater than the climb limited TOM.

32.3.1.3 (1912)
Which statement about reduced thrust is correct?
a) Reduced thrust can be used when the actual take-off mass is less than the field length limited take-off mass.
b) Reduced thrust is primarily a noise abatement procedure.
c) Reduced thrust is used in order to save fuel.
d) In case of reduced thrust V1 should be decreased.

32.3.1.3 (1913)
If the take-off mass of an aeroplane is tyre speed limited, downhill slope would
a) have no effect on the maximum mass for take-off.
b) decrease the maximum mass for take-off.
c) increase the maximum mass for take-off.
d) increase the required take-off distance.

32.3.1.3 (1914)
Reduced take-off thrust
a) has the benefit of improving engine life.
b) can be used if the actual take-off mass is higher than the performance limited take-off mass.
c) is not recommended at very low temperatures (OAT).
d) can be used if the headwind component during take-off is at least 10 kt.

32.3.1.4 (1915)
What will be the effect on an aeroplane's performance if aerodrome pressure altitude is decreased?
a) It will decrease the take-off distance required.
b) It will increase the take-off distance required.
c) It will increase the take-off ground run.
d) It will increase the accelerate stop distance.

32.3.1.4 (1916)
What will be the influence on the aeroplane performance if aerodrome pressure altitude is increased?
a) It will increase the take-off distance.
b) It will decrease the take-off distance.
c) It will increase the take-off distance available.
d) It will increase the accelerate stop distance available.

32.3.1.4 (1917)
How is VMCA influenced by increasing pressure altitude?
a) VMCA increases with increasing pressure altitude.
b) VMCA is not affected by pressure altitude.
c) VMCA decreases with increasing pressure altitude.
d) VMCA increases with pressure altitude higher than 4000 ft.

32.3.1.4 (1918)
Which one of the following is not affected by a tail wind?
a) the climb limited take-off mass.
b) the field limited take-off mass.
c) the obstacle limited take-off mass.
d) the take-off run.

32.3.1.4 (1919)
Other factors remaining constant and not limiting, how does increasing pressure altitude affect allowable take-off mass?
a) Allowable take-off mass decreases.
b) Allowable take-off mass increases.
c) There is no effect on allowable take-off mass.
d) Allowable take-off mass remains uninfluenced up to 5000 ft PA.

32.3.1.4 (1920)
For a take-off from a contaminated runway, which of the following statements is correct?
a) The performance data for take-off must be determined in general by means of calculation, only a few values are verified by flight tests.
b) The greater the depth of contamination at constant take-off mass, the more V1 has to be decreased to compensate for decreasing friction.
c) Dry snow is not considered to affect the take-off performance.
d) A slush covered runway must be cleared before take-off, even if the performance data for contaminated runway is available.

32.3.1.4 (1921)
How is wind considered in the take-off performance data of the Aeroplane Operations Manuals ?
a) Not more than 50% of a headwind and not less than 150% of the tailwind.
b) Unfactored headwind and tailwind components are used.
c) Not more than 80% headwind and not less than 125% tailwind.
d) Since take-offs with tailwind are not permitted, only headwinds are considered.

32.3.1.5 (1922)
The lowest take-off safety speed (V2 min) is:
a) 1.15 Vs for four-engine turboprop aeroplanes and 1.20 Vs for two or three-engine turboprop aeroplanes.
b) 1.20 Vs for all turbojet aeroplanes.
c) 1.15 Vs for all turbojet aeroplanes.
d) 1.20 Vs for all turboprop powered aeroplanes.

32.3.1.5 (1923)
Which of the following answers is true?
a) V1 <= VR
b) V1 > Vlof
c) V1 > VR
d) V1 < VMCG

32.3.1.5 (1924)
Which statement is correct?
a) VR is the speed at which rotation should be initiated.
b) VR is the lowest climb speed after engine failure.
c) In case of engine failure below VR the take-off should be aborted.
d) VR is the lowest speed for directional control in case of engine failure.

32.3.1.5 (1925)
Which statement is correct?
a) VR must not be less than 1.05 VMCA and not less than V1.
b) VR must not be less than VMCA and not less than 1.05 V1.
c) VR must not be less than 1.1 VMCA and not less than V1.
d) VR must not be less than 1.05 VMCA and not less than 1.1 V1.

32.3.1.5 (1926)
Which of the following represents the minimum for V1?
a) VMCG
b) VLOF
c) VMU
d) VR

32.3.1.5 (1927)
Which of the following represents the maximum value for V1 assuming max tyre speed and max brake energy speed are not limiting?
a) VR
b) VMCA
c) V2
d) VREF

32.3.1.5 (1928)
How is V2 affected if T/O flaps 20° is chosen instead of T/O flaps 10°?
a) V2 decreases if not restricted by VMCA.
b) V2 has the same value in both cases.
c) V2 increases in proportion to the angle at which the flaps are set.
d) V2 has no connection with T/O flap setting, as it is a function of runway length only.

32.3.1.5 (1929)
The speed V2 of a jet aeroplane must be greater than:
a) 1.2Vs.
b) 1.2VMCG.
c) 1.05VLOF.
d) 1.3V1.

32.3.1.5 (1930)
If the value of the balanced V1 is found to be lower than VMCG, which of the following is correct ?
a) The take-off is not permitted.
b) The one engine out take-off distance will become greater than the ASDR.
c) The VMCG will be lowered to V1.
d) The ASDR will become greater than the one engine out take-off distance.

32.3.1.6 (1931)
During certification test flights for a turbojet aeroplane, the actual measured take-off runs from brake release to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 feet above the take-off surface are:- 1747 m, all engines operating- 1950 m, with the critical engine failure recognized at V1, the other factors remaining unchanged.Considering both possibilities to determine the take-off run (TOR). What is the correct distance?
a) 2009 m.
b) 2243 m.
c) 2096 m.
d) 1950 m.

32.3.1.6 (1932)
During certification flight testing on a four engine turbojet aeroplane the actual take-off distances measured are:- 3050 m with failure of the critical engine recognised at V1- 2555 m with all engines operating and all other things being equalThe take-off distance adopted for the certification file is:

a) 3050 m
b) 3513 m
c) 2555 m
d) 2938 m

32.3.1.6 (1933)
During the flight preparation the climb limited take-off mass (TOM) is found to be much greater than the field length limited TOM using 5° flap. In what way can the performance limited TOM be increased? There are no limiting obstacles.
a) By selecting a higher flap setting.
b) By selecting a higher V2.
c) By selecting a lower V2.
d) By selecting a lower flap setting.

32.3.2.0 (1934)
In the event of engine failure below V1, the first action to be taken by the pilot in order to decelerate the aeroplane is to:
a) reduce the engine thrust.
b) reverse engine thrust.
c) apply wheel brakes.
d) deploy airbrakes or spoilers.

32.3.2.0 (1935)
If the antiskid system is inoperative, which of the following statements is true?
a) The accelerate stop distance increases.
b) The accelerate stop distance decreases.
c) It has no effect on the accelerate stop distance.
d) Take-off with antiskid inoperative is not permitted.

32.3.2.0 (1936)
In which of the following distances can the length of a stopway be included?
a) In the accelerate stop distance available.
b) In the one-engine failure case, take-off distance.
c) In the all-engine take-off distance.
d) In the take-off run available.

32.3.2.1 (1937)
Which statement concerning the inclusion of a clearway in take-off calculation is correct?
a) The field length limited take-off mass will increase.
b) The usable length of the clearway is not limited.
c) V1 is increased.
d) V1 remains constant.

32.3.2.1 (1938)
Balanced V1 is selected
a) if the accelerate stop distance is equal to the one engine out take-off distance.
b) for a runway length limited take-off with a stopway to give the highest mass.
c) for a runway length limited take-off with a clearway to give the highest mass.
d) if it is equal to V2.

32.3.2.1 (1939)
A 'Balanced Field Length' is said to exist where:
a) The accelerate stop distance is equal to the take-off distance available.
b) The clearway does not equal the stopway.
c) The accelerate stop distance is equal to the all engine take-off distance.
d) The one engine out take-off distance is equal to the all engine take-off distance.

32.3.2.1 (1940)
If the field length limited take off mass has been calculated using a Balanced Field Length technique, the use of any additional clearway in take off performance calculations may allow
a) a greater field length limited take off mass but with a lower V1
b) a greater field length limited take off mass but with a higher V1
c) the obstacle clearance limit to be increased with no effect on V1
d) the obstacle clearance limit to be increased with an higher V1

32.3.2.2 (1941)
Before take-off the temperature of the wheel brakes should be checked. For what reason?
a) Because overheated brakes will not perform adequately in the event of a rejected take-off.
b) To ensure that the brake wear is not excessive.
c) To ensure that the wheels have warmed up evenly.
d) To ensure that the thermal blow-out plugs are not melted.

32.3.2.2 (1942)
Concerning the landing gear, which of the following factors would limit the take-off mass?
a) Rate of rotation of the wheel at lift off and brake energy.
b) Tyre pressure and brake temperature.
c) Rate of rotation of the wheel and tyre pressure.
d) Nitrogen pressure in the strut and brake temperature.

32.3.2.2 (1943)
Which combination of circumstances or conditions would most likely lead to a tyre speed limited take-off?
a) A high runway elevation and tail wind.
b) A low runway elevation and a cross wind.
c) A high runway elevation and a head wind.
d) A low runway elevation and a head wind.

32.3.2.2 (1944)
The 'maximum tyre speed' limits:
a) VLOF in terms of ground speed.
b) V1 in kt TAS.
c) VR, or VMU if this is lower than VR.
d) V1 in kt ground speed.

32.3.2.2 (1945)
May anti-skid be considered to determine the take-off and landing data ?
a) Yes.

b) No.
c) Only for take-off.
d) Only for landing.

32.3.2.2 (1946)
A higher outside air temperature (OAT)
a) decreases the brake energy limited take-off mass.
b) increases the field length limited take-off mass.
c) increases the climb limited take-off mass.
d) decreases the take-off distance.

32.3.3.0 (1947)
If there is a tail wind, the climb limited TOM will:
a) not be affected.
b) increase.
c) decrease.
d) increase in the flaps extended case.

32.3.3.0 (1948)
Which of the following sets of factors will increase the climb-limited TOM?
a) Low flap setting, low PA, low OAT.
b) High flap setting, low PA, low OAT.
c) Low flap setting, high PA, high OAT.
d) Low flap setting, high PA, low OAT.

32.3.3.1 (1949)
(For this question use annex 032-1562A or Performance Manual MRJT 1 Figure 4.4)For a twin engine turbojet aeroplane two take-off flap settings (5° and 15°) are certified.Given:Field length avalaible= 2400 mOutside air temperature= -10°CAirport pressure altitude= 7000 ftThe maximum allowed take-off mass is:
a) 56 000 kg
b) 55 000 kg
c) 70 000 kg
d) 52 000 kg

32.3.3.1 (1950)
In relation to the net take-off flight path, the required 35 ft vertical distance to clear all obstacles is
a) the minimum vertical distance between the lowest part of the aeroplane and all obstacles within the obstacle corridor.
b) based on pressure altitudes.
c) the height by which acceleration and flap retraction should be completed.
d) the height at which power is reduced to maximum climb thrust.

32.3.3.1 (1951)
The minimum climb gradient required on the 2nd flight path segment after the take-off of a jet aeroplane is defined by the following parameters:1 Gear up2 Gear down3 Wing flaps retracted4 Wing flaps in take-off position5 N engines at the take-off thrust6 (N-1) engines at the take-off thrust7 Speed over the path equal to V2 + 10 kt8 Speed over the path equal to 1.3 VS9 Speed over the path equal to V210 At a height of 35 ft above the runwayThe correct statements are:
a) 1, 4, 6, 9
b) 2, 3, 6, 9
c) 1, 4, 5, 10
d) 1, 5, 8, 10

32.3.3.1 (1952)
The requirements with regard to take-off flight path and the climb segments are only specified for:
a) the failure of the critical engine on a multi-engines aeroplane.
b) the failure of any engine on a multi-engined aeroplane.
c) 2 engined aeroplane.
d) the failure of two engines on a multi-engined aeroplane.

32.3.3.1 (1953)
At which minimum height will the second climb segment end?
a) 400 ft above field elevation.
b) 35 ft above ground.
c) When gear retraction is completed.
d) 1500 ft above field elevation.

32.3.3.1 (1954)
A head wind will:
a) increase the climb flight path angle.
b) increase the angle of climb.
c) increase the rate of climb.
d) shorten the time of climb.

32.3.3.1 (1955)
The second segment begins
a) when landing gear is fully retracted.
b) when flap retraction begins.
c) when flaps are selected up.
d) when acceleration starts from V2 to the speed for flap retraction.

32.3.3.1 (1956)
For take-off obstacle clearance calculations, obstacles in the first segment may be avoided
a) by banking not more than 15° between 50 ft and 400 ft above the runway elevation.
b) by banking as much as needed if aeroplane is more than 50 ft above runway elevation.
c) only by using standard turns.
d) by standard turns - but only after passing 1500 ft.

32.3.3.1 (1957)
Which statement, in relation to the climb limited take-off mass of a jet aeroplane, is correct?
a) The climb limited take-off mass decreases with increasing OAT.
b) The climb limited take-off mass is determined at the speed for best rate of climb.
c) 50% of a head wind is taken into account when determining the climb limited take-off mass.

d) On high elevation airports equipped with long runways the aeroplane will always be climb limited.

32.3.3.1 (1958)
The first segment of the take-off flight path ends
a) at completion of gear retraction.
b) at completion of flap retraction.
c) at reaching V2.
d) at 35 ft above the runway.

32.3.3.1 (1959)
The climb limited take-off mass can be increased by
a) a lower flap setting for take-off and selecting a higher V2.
b) selecting a lower V1.
c) selecting a lower V2.
d) selecting a lower VR.

32.3.3.1 (1960)
During take-off the third segment begins:
a) when acceleration to flap retraction speed is started.
b) when landing gear is fully retracted.
c) when acceleration starts from VLOF to V2.
d) when flap retraction is completed.

32.3.3.1 (1961)
The take-off mass of an aeroplane is restricted by the climb limit. What would be the effect on this limit of an increase in the headwind component?
a) None.
b) The effect would vary depending upon the height of any obstacle within the net take-off flight path.
c) The climb limited take-off mass would increase.
d) The climb limited take-off mass would decrease.

32.3.3.1 (1962)
Which of the following statements with regard to the actual acceleration height at the beginning of the 3rd climb segment is correct?
a) The minimum value according to regulations is 400 ft.
b) A lower height than 400 ft is allowed in special circumstances e.g. noise abatement.
c) The minimum value according to regulations is 1000 ft.
d) There is no legal minimum value, because this will be determined from case to case during the calculation of the net flight path.

32.3.3.1 (1963)
On a segment of the take-off flight path an obstacle requires a minimum gradient of climb of 2.6% in order to provide an adequate margin of safe clearance. At a mass of 110000 kg the gradient of climb is 2.8%. For the same power and assuming that the sine of the angle of climb varies inversely with mass, at what maximum mass will the aeroplane be able to achieve the minimum gradient?
a) 118455 kg
b) 102150 kg
c) 121310 kg
d) 106425 kg

32.3.3.2 (1964)
A four jet-engined aeroplane (mass = 150 000 kg) is established on climb with all engines operating. The lift-to-drag ratio is 14.Each engine has a thrust of 75 000 Newtons. The gradient of climb is:(given: g= 10 m/s²)
a) 12.86%.
b) 1.286%.
c) 27%.
d) 7.86%.

32.3.3.2 (1965)
Which of the following statements is applicable to the acceleration height at the beginning of the 3rd climb segment ?
a) The maximum acceleration height depends on the maximum time take-off thrust may be applied.
b) The minimum legally allowed acceleration height is at 1500 ft.
c) There is no requirement for minimum climb performance when flying at the acceleration height.
d) The minimum one engine out acceleration height must be maintained in case of all engines operating.

32.3.3.3 (1966)
Given that the characteristics of a three engine turbojet aeroplane are as follows:Thrust = 50 000 Newton / Engineg = 10 m/s²Drag = 72 569 NMinimum gross gradient (2nd segment) = 2.7%SIN(Angle of climb) = (Thrust- Drag) / WeightThe maximum take-off mass under 2nd segment conditions is:
a) 101 596 kg
b) 286 781 kg
c) 74 064 kg
d) 209 064 kg

32.3.3.4 (1967)
The net flight path climb gradient after take-off compared to the gross climb gradient is:
a) smaller.
b) larger.
c) equal.
d) depends on type of aircraft.

32.3.3.4 (1968)
An operator shall ensure that the net take-off flight path clears all obstacles. The half-width of the obstacle-corridor at the distance D from the end of the TODA is at least:
a) 90m + 0.125D
b) 0.125D
c) -90m + 1.125D
d) 90m + D/0.125

32.3.3.4 (1969)
When V1 has to be reduced because of a wet runway the one engine out obstacle clearance / climb performance:
a) decreases / remains constant.
b) increases / increases.
c) remains constant / remains constant.
d) decreases / decreases.

32.3.3.4 (1970)
Which of the following statements, concerning the obstacle limited take-off mass for performance class A aeroplane, is correct?
a) It should be determined on the basis of a 35 ft obstacle clearance with the respect to the ""net take-off flight path"".
b) It should not be corrected for 30° bank turns in the take-off path.
c) It should be calculated in such a way that there is a margin of 50 ft with respect to the ""net take off flight path"".
d) It cannot be lower than the corresponding climb limited take-off mass.

32.3.3.4 (1971)
Regarding the obstacle limited take-off mass, which of the following statements is correct?
a) A take-off in the direction of an obstacle is also permitted in tail wind condition.
b) Wind speed plays no role when calculating this particular mass.
c) The obstacle limited mass can never be lower than the climb limited take-off mass.
d) The maximum bank angle which can be used is 10°.

32.3.3.4 (1972)
In the event that the take-off mass is obstacle limited and the take-off flight path includes a turn, the bank angle should not exceed
a) 15 degrees up to height of 400 ft.
b) 10 degrees up to a height of 400 ft.
c) 20 degrees up to a height of 400 ft.
d) 25 degrees up to a height of 400 ft.

32.3.3.4 (1973)
Which speed provides maximum obstacle clearance during climb?
a) The speed for which the ratio between rate of climb and forward speed is maximum.
b) V2 + 10 kt.
c) The speed for maximum rate of climb.
d) V2.

32.3.4.0 (1974)
(For this question use annex 032-915A)What is the maximum vertical speed of a three engine turbojet aeroplane with one engine inoperative (N-1) and a mass of 75 000 kg?Using the following: g = 10 m/s² 1 kt = 100 ft/min SIN(Angle of climb) = (Thrust- Drag)/ Weight
a) +1267 ft / min.
b) -1267 ft / min.
c) 0 ft / min.
d) +3293 ft / min.

32.3.4.1 (1975)
What is the effect of tail wind on the time to climb to a given altitude?
a) The time to climb does not change.
b) The time to climb increases.
c) The time to climb decreases.
d) The effect on time to climb will depend on the aeroplane type.

32.3.4.1 (1976)
You climb with a climb speed schedule 300/.78. What do you expect in the crossover altitude 29 200 ft (OAT = ISA) ?
a) The rate of climb increases since the constant IAS-climb is replaced by the constant Mach-climb.
b) The rate of climb decreases since climb performance at a constant Mach number is grossly reduced as compared to constant IAS.
c) During the acceleration to the Mach number .78 the rate of climb is approximately zero.
d) No noticeable effect since the true airspeed at 300 kt IAS and .78 Mach are the same (at ISA temperature TAS=460 kt)

32.3.4.1 (1977)
If the climb speed schedule is changed from 280/.74 to 290/.74 the new crossover altitude is
a) lower.
b) higher.
c) unchanged.
d) only affected by the aeroplane gross mass.

32.3.4.1 (1978)
(For this question use annex 032-3590A or Performance Manual MRJT 1 Figure 4.5)With regard to the take-off performance of a twin jet aeroplane, why does the take-off performance climb limit graph show a kink at 30°C, pressure altitude 0?
a) At higher temperatures the flat rated engines determines the climb limit mass.
b) At higher temperatures the VMBE determines the climb limit mass.
c) At lower temperatures one has to take the danger of icing into account.
d) The engines are pressure limited at lower temperature, at higher temperatures they are temperature limited.

32.3.4.1 (1979)
(For this question use annex 032-3591A or Performance Manual MRJT 1 Figure 4.5)Consider the take-off performance for the twin jet aeroplane climb limit chart. Why has the wind been omitted from the chart?
a) The climb limit performances are taken relative to the air.
b) The effect of the wind must be taken from another chart.
c) There is no effect of the wind on the climb angle relative to the ground.
d) There is a built-in safety measure.

32.3.4.2 (1980)
Vx and Vy with take-off flaps will be:
a) lower than that for clean configuration.
b) higher than that for clean configuration.
c) same as that for clean configuration.
d) changed so that Vx increases and Vy decreases compared to clean configuration.

32.3.4.2 (1981)
Other factors remaining constant, how does increasing altitude affect Vx and Vy:
a) Both will increase.
b) Both will remain the same.
c) Both will decrease.
d) Vx will decrease and Vy will increase.

32.3.4.2 (1982)
How does TAS vary in a constant Mach climb in the troposphere?
a) TAS decreases.
b) TAS increases.
c) TAS is constant.
d) TAS is not related to Mach Number.

32.3.4.2 (1983)
A jet aeroplane is climbing at a constant IAS and maximum climb thrust, how will the climb angle / the pitch angle change?
a) Reduce / decrease.
b) Reduce / remain constant.
c) Remain constant / decrease.
d) Remain constant / become larger.

32.3.4.2 (1984)
With a jet aeroplane the maximum climb angle can be flown at approximately:
a) The highest CL/CD ratio.
b) The highest CL/CD^2 ratio.
c) 1.2 Vs
d) 1.1 Vs

32.3.4.2 (1985)
What happens to the drag of a jet aeroplane if, during the initial climb after take off, constant IAS is maintained?(Assume a constant mass.)
a) The drag remains almost constant.
b) The drag increases considerably.
c) The drag decreases.
d) The drag increases initially and decreases thereafter.

32.3.4.2 (1986)
Which of the following sequences of speed for a jet aeroplane is correct ? (from low to high speeds)
a) Vs, maximum angle climb speed, maximum range speed.
b) Vs, maximum range speed, maximum angle climb speed.
c) Maximum endurance speed, maximum range speed, maximum angle of climb speed.
d) Maximum endurance speed, long range speed, maximum range speed.

32.3.4.2 (1987)
A jet aeroplane is climbing at constant Mach number below the tropopause. Which of the following statements is correct?
a) IAS decreases and TAS decreases.
b) IAS increases and TAS increases.
c) IAS decreases and TAS increases.
d) IAS increases and TAS decreases.

32.3.4.2 (1988)
Which of the following three speeds of a jet aeroplane are basically identical?The speeds for:
a) holding, maximum climb angle and minimum glide angle.
b) maximum drag, maximum endurance and maximum climb angle.
c) maximum range, minimum drag and minimum glide angle.
d) maximum climb angle, minimum glide angle and maximum range.

32.3.4.2 (1989)
What happens when an aeroplane climbs at a constant Mach number?
a) The lift coefficient increases.
b) The TAS continues to increase, which may lead to structural problems.
c) IAS stays constant so there will be no problems.
d) The ""1.3G"" altitude is exceeded, so Mach buffet will start immediately.

32.3.4.2 (1990)
A jet aeroplane is climbing with constant IAS. Which operational speed limit is most likely to be reached?
a) The Maximum operating Mach number.
b) The Stalling speed.
c) The Minimum control speed air.
d) The Mach limit for the Mach trim system.

32.3.4.2 (1991)
Higher gross mass at the same altitude decreases the gradient and the rate of climb whereas
a) VY and VX are increased.
b) VX is increased and VY is decreased.
c) VY and VX are not affected by a higher gross mass.
d) VY and VX are decreased.

32.3.4.2 (1992)
As long as an aeroplane is in a positive climb
a) VX is always below VY.
b) VX is sometimes below and sometimes above VY depending on altitude.
c) VX is always above VY.
d) VY is always above VMO.

32.3.4.2 (1993)
The best rate of climb at a constant gross mass
a) decreases with increasing altitude since the thrust available decreases due to the lower air density.
b) increases with increasing altitude since the drag decreases due to the lower air density.
c) increases with increasing altitude due to the higher true airspeed.
d) is independent of altitude.

32.3.4.2 (1994)
Given a jet aircraft. Which order of increasing speeds in the performance diagram is correct?
a) Vs, Vx, Maximum range speed
b) Maximum endurance speed, Long range speed, Maximum range speed
c) Vs, Maximum range speed, Vx
d) Maximum endurance speed, Maximum range speed, Vx

32.3.5.0 (1995)
The optimum long-range cruise altitude for a turbojet aeroplane:
a) increases when the aeroplane mass decreases.
b) is always equal to the powerplant ceiling.
c) is independent of the aeroplane mass.
d) is only dependent on the outside air temperature.

32.3.5.1 (1996)
Which statement with respect to the step climb is correct?
a) Executing a desired step climb at high altitude can be limited by buffet onset at g-loads larger than 1.
b) A step climb must be executed immediately after the aeroplane has exceeded the optimum altitude.
c) A step climb is executed because ATC desires a higher altitude.
d) A step climb is executed in principle when, just after leveling off, the 1.3g altitude is reached.

32.3.5.1 (1997)
Which of the following factors determines the maximum flight altitude in the ""Buffet Onset Boundary"" graph?
a) Aerodynamics.
b) Theoretical ceiling.
c) Service ceiling.
d) Economy.

32.3.5.1 (1998)
Which data can be extracted from the Buffet Onset Boundary Chart?
a) The values of the Mach number at which low speed and Mach buffet occur at various masses and altitudes.
b) The value of maximum operating Mach number (MMO) at various masses and power settings.
c) The value of the critical Mach number at various masses and altitudes.
d) The value of the Mach number at which low speed and shockstall occur at various weights and altitudes.

32.3.5.1 (1999)
The aerodynamic ceiling
a) is the altitude at which the speeds for low speed buffet and for high speed buffet are the same.
b) depends upon thrust setting and increase with increasing thrust.
c) is the altitude at which the best rate of climb theoretically is zero.
d) is the altitude at which the aeroplane reaches 50 ft/min.

32.3.5.1 (2000)
The maximum operating altitude for a certain aeroplane with a pressurised cabin
a) is the highest pressure altitude certified for normal operation.
b) is dependent on aerodynamic ceiling.
c) is dependent on the OAT.
d) is only certified for four-engine aeroplanes.

32.3.5.1 (2001)
Why are 'step climbs' used on long distance flights ?
a) To fly as close as possible to the optimum altitude as aeroplane mass reduces.
b) Step climbs are only justified if at the higher altitude less headwind or more tailwind can be expected.
c) Step climbs do not have any special purpose for jet aeroplanes, they are used for piston engine aeroplanes only.
d) To respect ATC flight level constraints.

32.3.5.1 (2002)
Which statement with respect to the step climb is correct ?
a) Performing a step climb based on economy can be limited by the 1.3-g altitude.
b) In principle a step climb is performed immediately after the aircraft has exceeded the optimum altitude.
c) A step climb may not be performed unless it is indicated in the filed flight plan.
d) A step climb provides better economy than a cruise climb.

32.3.5.2 (2003)
With all other things remaining unchanged and with T the outside static air temperature expressed in degrees K, the hourly fuel consumption of a turbojet powered aeroplane in a cruise flight with a constant Mach Number and zero headwind,is as follows:
a) proportional to T
b) proportional to $1/T^2$
c) proportional to 1/T
d) independent from T

32.3.5.2 (2004)
Two identical turbojet aeroplanes (whose specific fuel consumption is assumed to be constant) are in a holding pattern at the same altitude. The mass of the first one is 95 000 kg and its hourly fuel consumption is equal to 3100 kg/h. Since the mass of the second one is 105 000 kg, its hourly fuel consumption is:
a) 3259 kg/h
b) 3602 kg/h
c) 3787 kg/h
d) 3426 kg/h

32.3.5.2 (2005)
A jet aeroplane equipped with old engines has a specific fuel consumption of 0.06 kg per Newton of thrust and per hour and, in a given flying condition, a fuel mileage of 14 kg per Nautical Mile. In the same flying conditions, the same aeroplane equipped with modern engines with a specific fuel consumption of 0.035 kg per Newton of thrust and per hour, has a fuel mileage of:
a) 8.17 kg/NM.

b) 14 kg/NM.
c) 11.7 kg/NM.
d) 10.7 kg/NM.

32.3.5.2 (2006)
At a given altitude, when a turbojet aeroplane mass is increased by 5% - assuming the engines specific consumption remains unchanged -, its hourly consumption is approximately increased by:
a) 5%
b) 7.5%
c) 10%
d) 2.5%

32.3.5.2 (2007)
For jet-engined aeroplanes, what is the effect of increased altitude on specific range?
a) Increases.
b) Decreases.
c) Does not change.
d) Increases only if there is no wind.

32.3.5.2 (2008)
(For this question use annex 032-1014A)Assuming constant L/D ratio, which of the diagrams provided correctly shows the movement of the ""Thrust Required Curve . (M1>M2).
a) c
b) a
c) b
d) d

32.3.5.2 (2009)
Long range cruise is a flight procedure which gives:
a) a specific range which is about 99% of maximum specific range and higher cruise speed.
b) a 1% higher TAS for maximum specific range.
c) an IAS which is 1% higher than the IAS for maximum specific range.
d) a specific range which is 99% of maximum specific range and a lower cruise speed.

32.3.5.2 (2010)
With zero wind, the angle of attack for maximum range for an aeroplane with turbojet engines is:
a) equal to that of maximum lift to drag ratio.
b) equal to that maximum endurance.
c) equal to that corresponding to zero induced drag.
d) lower than that of maximum lift to drag ratio.

32.3.5.2 (2011)
Two identical turbojet aeroplane (whose specific fuel consumptions are considered to be equal) are at holding speed at the same altitude.The mass of the first aircraft is 130 000 kg and its hourly fuel consumption is 4300 kg/h. The mass of the second aircraft is 115 000 kg and its hourly fuel consumption is:
a) 3804 kg/h.
b) 4044 kg/h.
c) 3365 kg/h.
d) 3578 kg/h.

32.3.5.2 (2012)
A jet aeroplane is flying long range cruise. How does the specific range / fuel flow change?
a) Increase / decrease.
b) Increase / increase.
c) Decrease / increase.
d) Decrease / decrease.

32.3.5.2 (2013)
During a cruise flight of a jet aeroplane at constant flight level and at the maximum range speed, the IAS / the drag will:
a) decrease / decrease.
b) increase / decrease.
c) increase / increase.
d) decrease / increase.

32.3.5.2 (2014)
The lowest point of the drag or thrust required curve of a jet aeroplane, respectively, is the point for
a) minimum drag.
b) maximum specific range.
c) maximum endurance.
d) minimum specific range.

32.3.5.2 (2015)
For a jet transport aeroplane, which of the following is the reason for the use of 'maximum range speed' ?
a) Minimum specific fuel consumption.
b) Minimum fuel flow.
c) Longest flight duration.
d) Minimum drag.

32.3.5.2 (2016)
Consider the graphic representation of the power required versus true air speed (TAS), for a jet aeroplane with a given mass. When drawing the tangent out of the origin, the point of contact determines the speed of:
a) maximum endurance.
b) minimum power.
c) maximum specific range.
d) critical angle of attack.

32.3.5.2 (2017)
A jet aeroplane is performing a maximum range flight.The speed corresponds to:
a) the point of contact of the tangent from the origin to the Drag versus TAS curve.
b) the minimum drag.
c) the minimum required power.

d) the point of contact of the tangent from the origin to the power required (Pr) versus TAS curve.

32.3.5.2 (2018)
In the drag versus TAS curve for a jet aeroplane, the speed for maximum range corresponds with:
a) the point of contact of the tangent from the origin to the drag curve.
b) the point of intersection of the parasite drag curve and the induced drag curve.
c) the point of contact of the tangent from the origin to the parasite drag curve.
d) the point of contact of the tangent from the origin to the induced drag curve.

32.3.5.2 (2019)
The pilot of a jet aeroplane wants to use a minimum amount of fuel between two airfields. Which flight procedure should the pilot fly?
a) Maximum range.
b) Maximum endurance.
c) Holding.
d) Long range.

32.3.5.2 (2020)
Which of the following is a reason to operate an aeroplane at 'long range speed'?
a) It is efficient to fly slightly faster than with maximum range speed.
b) In order to achieve speed stability.
c) The aircraft can be operated close to the buffet onset speed.
d) In order to prevent loss of speed stability and tuck-under.

32.3.5.2 (2021)
""Maximum endurance""
a) is achieved in unaccelerated level flight with minimum fuel consumption.
b) is the same as maximum specific range with wind correction.
c) can be flown in a steady climb only.
d) can be reached with the 'best rate of climb' speed in level flight.

32.3.5.2 (2022)
The speed for maximum endurance
a) is always lower than the speed for maximum specific range.
b) is the lower speed to achieve 99% of maximum specific range.
c) can either be higher or lower than the speed for maximum specific range.
d) is always higher than the speed for maximum specific range.

32.3.5.2 (2023)
Which of the equations below defines specific range (SR)?
a) SR = True Airspeed/Total Fuel Flow
b) SR = Indicated Airspeed/Total Fuel Flow
c) SR = Mach Number/Total Fuel Flow
d) SR = Groundspeed/Total Fuel Flow

32.3.5.2 (2024)
Long range cruise is selected as
a) the higher speed to achieve 99% of maximum specific range in zero wind.
b) the speed for best economy.
c) the climbing cruise with one or two engines inoperative.
d) specific range with tailwind.

32.3.5.2 (2025)
The airspeed for jet aeroplanes at which power required is a minimum
a) is always lower than the minimum drag speed.
b) is always higher than the minimum drag speed.
c) is lower than the minimum drag speed in the climb and higher than the minimum drag speed in the descent.
d) is the same as the minimum drag speed.

32.3.5.2 (2026)
Moving the center of gravity from the forward to the aft limit (gross mass, altitude and airspeed remain unchanged)
a) decreases the induced drag and reduces the power required.
b) increases the power required.
c) affects neither drag nor power required.
d) increases the induced drag.

32.3.5.2 (2027)
The centre of gravity near, but still within, the aft limit
a) improves the maximum range.
b) increases the stalling speed.
c) improves the longitudinal stabiity.
d) decreases the maximum range.

32.3.5.2 (2028)
The speed range between low speed buffet and high speed buffet
a) narrows with increasing mass and increasing altitude.
b) decreases with increasing mass and is independent of altitude.
c) is only limiting at low altitudes.
d) increases with increasing mass.

32.3.5.2 (2029)
The danger associated with low speed and/or high speed buffet
a) limits the maneuvering load factor at high altitudes.
b) can be reduced by increasing the load factor.
c) exists only above MMO.
d) has to be considered at take-off and landing.

32.3.5.2 (2030)
Which of the jet engine ratings below is not a certified rating?
a) Maximum Cruise Thrust
b) Maximum Continuous Thrust
c) Go-Around Thrust
d) Maximum Take-off Thrust

32.3.5.2 (2031)
At constant thrust and constant altitude the fuel flow of a jet engine

a) increases slightly with increasing airspeed.
b) is independent of the airspeed.
c) decreases slightly with increasing airspeed.
d) increases with decreasing OAT.

32.3.5.2 (2032)
At a constant Mach number the thrust and the fuel flow of a jet engine
a) decrease in proportion to the ambient pressure at constant temperature.
b) increase with increasing altitude.
c) are independent of outside air temperature (OAT).
d) increase in proportion to the ambient pressure at constant temperature.

32.3.5.2 (2033)
The thrust of a jet engine at constant RPM
a) increases in proportion to the airspeed.
b) does not change with changing altitude.
c) is independent of the airspeed.
d) is inversely proportional to the airspeed.

32.3.5.2 (2034)
The intersections of the thrust available and the drag curve are the operating points of the aeroplane
a) in unaccelerated level flight.
b) in descent with constant IAS.
c) in accelerated level flight.
d) in unaccelerated climb.

32.3.5.2 (2035)
At speeds below minimum drag
a) a lower speed requires a higher thrust.
b) a higher speed requires a higher thrust.
c) the aeroplane can not be controlled manually.
d) the aeroplane can be controlled only in level flight.

32.3.5.2 (2036)
A higher altitude at constant mass and Mach number requires
a) a higher angle of attack.
b) a lower coefficient of lift.
c) a lower coefficient of drag.
d) a lower angle of attack.

32.3.5.2 (2037)
The long range cruise speed is in relation to the speed for maximum range cruise.
a) Higher
b) Lower
c) Depending on the OAT and net mass.
d) Depending on density altitude and mass.

32.3.5.2 (2038)
The optimum cruise altitude is
a) the pressure altitude at which the best specific range can be achieved.
b) the pressure altitude at which the fuel flow is a maximum.
c) the pressure altitude up to which a cabin altitude of 8000 ft can be maintained.
d) the pressure altitude at which the speed for high speed buffet as TAS is a maximum.

32.3.5.2 (2039)
The optimum cruise altitude increases
a) if the aeroplane mass is decreased.
b) if the temperature (OAT) is increased.
c) if the tailwind component is decreased.
d) if the aeroplane mass is increased.

32.3.5.2 (2040)
Below the optimum cruise altitude
a) the Mach number for long range cruise decreases continuously with decreasing altitude.
b) the IAS for long range cruise increases continuously with decreasing altitude.
c) the TAS for long range cruise increases continuously with decreasing altitude.
d) the Mach number for long range cruise increases continuously with decreasing altitude.

32.3.5.2 (2041)
Under which condition should you fly considerably lower (4 000 ft or more) than the optimum altitude ?
a) If at the lower altitude either considerably less headwind or considerably more tailwind can be expected.
b) If the maximum altitude is below the optimum altitude.
c) If the temperature is lower at the low altitude (high altitude inversion).
d) If at the lower altitude either more headwind or less tailwind can be expected.

32.3.5.2 (2042)
On a long distance flight the gross mass decreases continuously as a consequence of the fuel consumption. The result is:
a) The specific range and the optimum altitude increases.
b) The speed must be increased to compensate the lower mass.
c) The specific range increases and the optimum altitude decreases.
d) The specific range decreases and the optimum altitude increases.

32.3.5.2 (2043)
If the thrust available exceeds the thrust required for level flight
a) the aeroplane accelerates if the altitude is maintained.
b) the aeroplane descends if the airspeed is maintained.
c) the aeroplane decelerates if it is in the region of reversed command.
d) the aeroplane decelerates if the altitude is maintained.

32.3.5.2 (2044)
In a given configuration the endurance of a piston engined aeroplane only depends on:
a) altitude, speed, mass and fuel on board.
b) altitude, speed and mass.
c) speed and mass.
d) speed, mass and fuel on board.

32.3.5.2 (2045)
Which of the following statements with regard to the optimum cruise altitude (best fuel mileage) is correct?
a) An aeroplane sometimes flies above the optimum cruise altitude, because ATC normally does not allow to fly continuously at the optimum cruise altitude.
b) An aeroplane always flies below the optimum cruise altitude, as otherwise Mach buffet can occur.
c) An aeroplane always flies on the optimum cruise altitude, because this is most attractive from an economy point of view.
d) An aeroplane usually flies above the optimum cruise altitude, as this provides the largest specific range.

32.3.5.3 (2046)
An aeroplane operating under the 180 minutes ETOPS rule may be up to :
a) 180 minutes flying time to a suitable airport in still air with one engine inoperative.
b) 180 minutes flying time to a suitable airport under the prevailing weather condition with one engine inoperative.
c) 180 minutes flying time from suitable airport in still air at a normal cruising speed
d) 90 minutes flying time from the first enroute airport and another 90 minutes from the second enroute airport in still air with one engine inoperative.

32.3.5.3 (2047)
ETOPS flight is a twin engine jet aeroplane flight conducted over a route, where no suitable airport is within an area of
a) 60 minutes flying time in still air at the approved one engine out cruise speed.
b) 60 minutes flying time in still air at the normal cruising speed.
c) 30 minutes flying time at the normal cruising speed.
d) 75 minutes flying time at the approved one engine out cruise speed.

32.3.5.3 (2048)
(For this question use annex 032-3589A or Performance Manual MRJT 1 Figure 4.24)With regard to the drift down performance of the twin jet aeroplane, why does the curve representing 35 000 kg gross mass in the chart for drift down net profiles start at approximately 3 minutes at FL370?
a) Because at this mass it takes about 3 minutes to decelerate to the optimum speed for drift down at the original cruising level.
b) Because at this mass the engines slow down at a slower rate after failure, there is still some thrust left during four minutes.
c) Due to higher TAS at this mass it takes more time to develop the optimal rate of descent, because of the inertia involved.
d) All the curves start at the same point, which is situated outside the chart.

32.3.5.3 (2049)
A twin jet aeroplane is in cruise, with one engine inoperative, and has to overfly a high terrain area. In order to allow the greatest clearance height, the appropriate airspeed must be the airspeed
a) of greatest lift-to-drag ratio.
b) giving the lowest Cl/Cd ratio.
c) giving the highest Cd/Cl ratio.
d) for long-range cruise.

32.3.5.3 (2050)
The drift down requirements are based on:
a) the obstacle clearance during a descent to the new cruising altitude if an engine has failed.
b) the actual engine thrust output at the altitude of engine failure.
c) the maximum flight path gradient during the descent.
d) the landing mass limit at the alternate.

32.3.5.3 (2051)
Which of the following statements is correct?
a) When determining the obstacle clearance during drift down, fuel dumping may be taken into account.
b) The drift down regulations require a minimum descent angle after an engine failure at cruising altitude.
c) The drift down procedure requires a minimum obstacle clearance of 35 ft.
d) An engine failure at high cruising altitude will always result in a drift down, because it is not permitted to fly the same altitude as with all engines operating.

32.3.5.3 (2052)
With all engines out, a pilot wants to fly for maximum time. Therefore he has to fly the speed corresponding to:
a) the minimum drag.
b) the critical Mach number.
c) the minimum angle of descent.
d) the maximum lift.

32.3.5.3 (2053)
After engine failure the aeroplane is unable to maintain its cruising altitude. What is the procedure which should be applied?
a) Drift Down Procedure.
b) Emergency Descent Procedure.
c) ETOPS.
d) Long Range Cruise Descent.

32.3.5.3 (2054)
'Drift down' is the procedure to be applied
a) after engine failure if the aeroplane is above the one engine out maximum altitude.
b) after cabin depressurization.
c) to conduct an instrument approach at the alternate.
d) to conduct a visual approach if VASI is available.

32.3.5.3 (2055)
If the level-off altitude is below the obstacle clearance altitude during a drift down procedure
a) fuel jettisoning should be started at the beginning of drift down.
b) the recommended drift down speed should be disregarded and it should be flown at the stall speed plus 10 kt.
c) fuel jettisoning should be started when the obstacle clearance altitude is reached.
d) the drift down should be flown with flaps in the approach configuration.

32.3.5.3 (2056)
With one or two engines inoperative the best specific range at high altitudes is
a) reduced.
b) improved.
c) not affected.
d) first improved and later reduced.

32.3.5.3 (2057)
(For this question use annex 032-4732A or Performance Manual MRJT 1 Figure 4.24)With regard to the drift down performance of the twin jet aeroplane, what is meant by ""equivalent gross weight at engine failure"" ?
a) The equivalent gross weight at engine failure is the actual gross weight corrected for OAT higher than ISA +10°C.
b) The increment represents fuel used before engine failure.
c) This gross weight accounts for the lower Mach number at higher temperatures.
d) The increment accounts for the higher fuel flow at higher temperatures.

32.3.5.4 (2058)
The drift down procedure specifies requirements concerning the:
a) obstacle clearance during descent to the net level-off altitude
b) engine power at the altitude at which engine failure occurs
c) climb gradient during the descent to the net level-off altitude
d) weight during landing at the alternate

32.3.5.4 (2059)
Which one of the following statements concerning drift-down is correct?
a) When determining the obstacle clearance during drift-down, fuel dumping may be taken into account.
b) The drift-down procedure requires a minimum descent angle after an engine failure at cruising altitude.
c) The drift-down procedure requires a minimum obstacle clearance of 35 ft.
d) An engine failure at high cruising altitude will always result in a drift-down, because it is not permitted to fly the same altitude with one engine inoperative as with all engines operating.

32.3.6.1 (2060)
During a descent at constant Mach Number, the margin to low speed buffet will:
a) increase, because the lift coefficient decreases.
b) remain constant, because the Mach number remains constant.
c) increase, because the lift coefficient increases.
d) decrease, because the lift coefficient decreases.

32.3.6.1 (2061)
During a glide at constant Mach number, the pitch angle of the aeroplane will:
a) decrease.
b) increase.
c) increase at first and decrease later on.
d) remain constant.

32.3.6.1 (2062)
An aeroplane carries out a descent from FL 410 to FL 270 at cruise Mach number, and from FL 270 to FL 100 at the IAS reached at FL 270.How does the angle of descent change in the first and in the second part of the descent?Assume idle thrust and clean configuration and ignore compressibility effects.
a) Increases in the first part, is constant in the second.
b) Increases in the first part, decreases in the second.
c) Is constant in the first part, decreases in the second.
d) Decreases in the first part, increases in the second.

32.3.6.1 (2063)
The lift coefficient decreases during a glide with constant Mach number, mainly because the :
a) IAS increases.
b) aircraft mass decreases.
c) TAS decreases.
d) glide angle increases.

32.3.6.1 (2064)
A jet aeroplane descends with constant Mach number. Which of the following speed limits is most likely to be exceeded first?
a) Maximum Operating Speed
b) Never Exceed Speed
c) High Speed Buffet Limit
d) Maximum Operational Mach Number

32.3.6.1 (2065)
Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?
a) The higher the gross mass the greater is the speed for descent.
b) The higher the gross mass the lower is the speed for descent.
c) The higher the average temperature (OAT) the lower is the speed for descent.
d) The mass of an aeroplane does not have any effect on the speed for descent.

32.3.6.1 (2066)
Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?
a) A tailwind component increases the ground distance.
b) A headwind component increases the ground distance.
c) A tailwind component increases fuel and time to descent.
d) A tailwind component decreases the ground distance.

32.3.6.1 (2067)
Is there any difference between the vertical speed versus forward speed curves for two identical aeroplanes having different masses ? (assume zero thrust and wind)
a) Yes, the difference is that for a given angle of attack both the vertical and forward speeds of the heavier aeroplane will be larger.
b) No difference.
c) Yes, the difference is that the heavier aeroplane will always glide a greater distance.
d) Yes, the difference is that the lighter aeroplane will always glide a greater distance.

32.3.6.3 (2068)
A flight is planned with a turbojet aeroplane to an aerodrome with a landing distance available of 2400 m. Which of the following is the maximum landing

distance for a dry runway?
a) 1 440 m.
b) 1 250 m.
c) 1 090 m.
d) 1 655 m.

32.3.6.3 (2069)
For a turbojet aeroplane, what is the maximum landing distance for wet runways when the landing distance available at an aerodrome is 3000 m?
a) 1565 m.
b) 1800 m.
c) 2609 m.
d) 2 070 m.

32.3.6.3 (2070)
The approach climb requirement has been established so that the aeroplane will achieve:
a) minimum climb gradient in the event of a go-around with one engine inoperative.
b) obstacle clearance in the approach area.
c) manoeuverability in the event of landing with one engine inoperative.
d) manoeuverability during approach with full flaps and gear down, all engines operating.

32.3.6.3 (2071)
For jet aeroplanes which of the following statements is correct?
a) When determining the maximum allowable landing mass at destination, 60% of the available distance is taken into account, if the runway is expected to be dry.
b) In any case runway slope is one of the factors taken into account when determining the required landing field length.
c) An anti-skid system malfunction has no effect on the required landing field length.
d) The required landing field length is the distance from 35 ft to the full stop point.

32.3.6.3 (2072)
Which of the following is true according to JAA regulations for turbopropeller powered aeroplanes not performing a steep approach?
a) Maximum Landing Distance at the destination aerodrome and at any alternate aerodrome is 0,7 x LDA (Landing Distance Available).
b) Maximum Landing Distance at destination is 0,95 x LDA (Landing Distance Available).
c) Maximum Take-off Run is 0,5 x runway.
d) Maximum use of clearway is 1,5 x runway.

32.3.6.3 (2073)
To minimize the risk of hydroplaning during landing the pilot should:
a) make a ""positive"" landing and apply maximum reverse thrust and brakes as quickly as possible.
b) use maximum reverse thrust, and should start braking below the hydroplaning speed.
c) use normal landing-, braking- and reverse technique.
d) postpone the landing until the risk of hydroplaning no longer exists.

32.3.6.3 (2074)
Approaching in turbulent wind conditions requires a change in the landing reference speed (VREF):
a) Increasing VREF
b) Lowering VREF
c) Keeping same VREF because wind has no influence on IAS.
d) Increasing VREF and making a steeper glide path to avoid the use of spoilers.

32.3.6.3 (2075)
What margin above the stall speed is provided by the landing reference speed VREF?
a) 1,30 VSO
b) 1,05 VSO
c) 1,10 VSO
d) VMCA x 1,2

32.3.6.3 (2076)
Required runway length at destination airport for turboprop aeroplanes
a) is the same as at an alternate airport.
b) is less then at an alternate airport.
c) is more than at an alternate airport.
d) is 60% longer than at an alternate airport.

32.3.6.3 (2077)
The landing reference speed VREF has, in accordance with international requirements, the following margins above stall speed in landing configuration:
a) 30%
b) 15%
c) 20%
d) 10%

32.3.6.3 (2078)
The maximum mass for landing could be limited by
a) the climb requirements with one engine inoperative in the approach configuration.
b) the climb requirements with one engine inoperative in the landing configuration.
c) the climb requirements with all engines in the approach configuration.
d) the climb requirements with all engines in the landing configuration but with gear up.

32.3.6.3 (2079)
The landing field length required for turbojet aeroplanes at the destination (wet condition) is the demonstrated landing distance plus
a) 92%
b) 67%
c) 70%
d) 43%

32.3.6.3 (2080)
The landing field length required for jet aeroplanes at the alternate (wet condition) is the demonstrated landing distance plus
a) 92%
b) 43%

c) 70%
d) 67%

32.3.6.3 (2081)
(For this question use annex 032-4733A or Performance Manual MRJT 1 Figure 4.28)What is the minimum field length required for the worst wind situation, landing a twin jet aeroplane with the anti-skid inoperative?Elevation: 2000 ftQNH: 1013 hPaLanding mass: 50 000 kgFlaps: as required for minimum landing distanceRunway condition: dryWind: Maximum allowable tailwind: 15 ktMaximum allowable headwind: 50 kt
a) 3100 m.
b) 2600 m.
c) 2700 m.
d) 2900 m.

32.3.6.3 (2082)
The approach climb requirement has been established to ensure:
a) minimum climb gradient in case of a go-around with one engine inoperative.
b) obstacle clearance in the approach area.
c) manoeuvrability in case of landing with one engine inoperative.
d) manoeuvrability during approach with full flaps and gear down, all engines operating.

32.3.6.3 (2083)
By what factor must the landing distance available (dry runway) for a turbojet powered aeroplane be multiplied to find the landing distance required? (planning phase for destination).
a) 0.60
b) 115/100
c) 1.67
d) 60/115

32.3.6.3 (2084)
According to JAR-OPS 1, which one of the following statements concerning the landing distance for a turbojet aeroplane is correct?
a) When determining the maximum allowable landing mass at destination, 60% of the available landing runway length should be taken into account.
b) Reverse thrust is one of the factors always taken into account when determining the landing distance required.
c) Malfunctioning of an anti-skid system has no effect on the required runway length.
d) The landing distance is the distance from 35 ft above the surface of the runway to the full stop.

32.3.7.2 (2085)
If a flight is performed with a higher ""Cost Index"" at a given mass which of the following will occur?
a) A higher cruise mach number.
b) A lower cruise mach number.
c) A better maximum range.
d) A better long range.

33.1.1.1 (2086)
An aircraft is flying at MACH 0.84 at FL 330. The static air temperature is -48°C and the headwind component 52 Kt. At 1338 UTC the controller requests the pilot to cross the meridian of 030W at 1500 UTC. Given the distance to go is 570 NM, the reduced MACH No. should be:
a) 0.80
b) 0.78
c) 0.76
d) 0.72

33.1.1.1 (2087)
According to the chart the minimum obstruction clearance altitude (MOCA) is 8500 ft. The meteorological data gives an outside air temperature of -20°C at FL 85. The QNH, given by a met. station at an elevation of 4000ft, is 1003 hPa.What is the minimum pressure altitude which should be flown according to the given MOCA?
a) 8800 ft.
b) 8500 ft.
c) 12800 ft.
d) 8200 ft.

33.1.1.1 (2088)
VFR flights shall not be flown over the congested areas of cities at a height less than
a) 1000 ft above the heighest obstacle within a radius of 600 m from the aircraft.
b) 2000 ft above the heighest obstacle within a radius of 600 ft from the aircraft.
c) 500 ft above the heighest obstacle.
d) the heighest obstacle.

33.1.1.1 (2089)
How many feet you have to climb to reach FL 75?Given: FL 75, departure aerodrome elevation 1500 ft, QNH = 1023 hPa, temperature = ISA, 1 hPa = 30 ft
a) 6300 ft.
b) 6000 ft.
c) 6600 ft.
d) 7800 ft.

33.1.1.1 (2090)
(For this question use annex 033-9719A, AERONAUTICAL CHART ICAO 1:500 000 STUTTGART (NO 47/6) or Route Manual VFR+GPS chart ED-6)An aeroplane is flying VFR and approaching position TANGO VORTAC (48°37'N, 009°16'E) at FL 055 and magnetic course 090°, distance from VORTAC TANGO 20 NM.Name the frequency of the TANGO VORTAC.
a) 112.50 MHz
b) 118.60 MHz
c) 422 kHz
d) 118.80 MHz

33.1.1.1 (2091)
(For this question use annex 033-9736A, AERONAUTICAL CHART ICAO 1:500 000 STUTTGART (NO 47/6) or Route Manual VFR+GPS chart ED-6)Flying VFR from VILLINGEN (48°03.5'N, 008°27.0'E) to FREUDENSTADT (48°28.0'N,

c) TANGO / FL280 N0350
d) TANGO / KT350 F280

33.6.1.7 (2516)
On a ATC flight plan, to indicate that you will overfly the way-point ROMEO at 120 kt at flight level 085, you will write :
a) ROMEO / N0120 F085
b) ROMEO / K0120 FL085
c) ROMEO / FL085 N0120
d) ROMEO / F085 N0120

33.7.1.1 (2517)
To carry out a VFR flight to an off-shore platform, the minimum fuel quantity on board is:
a) identical to that defined for VFR flights over land
b) at least equal to that defined for IFR flights
c) that defined for VFR flights over land increased by 5 %
d) that defined for VFR flights over land increased by 10 %

33.7.1.1 (2518)
For a flight to an off-shore platform, an alternate aerodrome is compulsory, except if :1 - flight duration does not exceed two hours2 - during the period from two hours before to two hours after the estimated landing time, the forecast conditions of ceiling and visibility are not less than one and a half times the applicable minima3 - the platform is available and no other flight either from or to the platform is expected between the estimated time of departure and one half hour after the estimated landing timeThe combination which regroups all of the correct statements is :
a) 2001-02-03
b) 02-Jan
c) 1 - 3
d) 2 - 3

33.7.1.2 (2519)
A helicopter is on a 150 NM leg to an off-shore oil rig. Its TAS is 130 kt with a 20 kt tailwind, its endurance is 3h30min without reserve. Upon reaching destination, it is asked to proceed outbound to locate a ship in distress, on a track which gives a 15 kt tailwind. Maintaining zero reserve on return to the oil rig, the helicopter can fly outbound for distance of:
a) 160.3 NM
b) 224.5 NM
c) 158.6 NM
d) 222.1 NM

40.1.1.1 (2520)
Concerning the relation between performance and stress, which of the following statement(s) is (are) correct?
a) A moderate level of stress may improve performance.
b) A student will learn faster and better under severe stress.
c) Domestic stress will not affect the pilot's performance because he is able to leave this type of stress on the ground.
d) A well trained pilot is able to eleminate any kind of stress completely when he is scheduled to fly.

40.1.1.1 (2521)
Stress is a frequent aspect of the pilot's job. Under which of the following circumstances does it occur?1. Stress occurs whenever the pilot must revise his plan of action and does not immediately have a solution2. Stress occurs with unexperienced pilots when the situational demands exceed their individual capabilities3. Stress occurs if a pilot is convinced that he will not be able to find a solution for the problem he just is confronted with
a) 1, 2 and 3 are correct
b) Only 1 is false
c) 1 and 2 are correct, 3 is false
d) 1 is correct, 2 and 3 are false

40.1.1.1 (2522)
Divided attention is the ability :1. to execute several mental activities at almost the same time (i.e. when switching attention from outside the aircraft to the airspeed indicator on the instrument panel)2. to monitor the progress of a motor programme (i.e. flying or taxiing the airplane) on a relatively subconscious level, while making a radio call at the same time (requiring a rather conscious level)3 .to select information and check if it is relevant to the task in hand. At the same time no other operation can be performed.4. to delegate tasks to the copilot while concentrating on the procedures
a) 1 and 2 are correct, 3 and 4 are false
b) 1,2 and 3 are correct, 4 is false
c) 1 and 3 are correct, 2 and 4 are false
d) Only 3 is false

40.1.1.1 (2523)
The physiology of stress is now well known:
a) stress promotes an increase in physical strength rather than promoting mental oerformance
b) the only stress hormone is adrenaline
c) stress develops in 2 stages: sublimation of performance and then acceleration of heart rate and increase in vision
d) stress slows down the production of sugar by the organism and thereby slows down the heart rate

40.1.1.1 (2524)
An overstressed pilot may show the following symptoms:1. mental blocks, confusion and channelized attention2. resignation, frustration, rage3. deterioration in motor coordination4. high pitch voice and fast speaking
a) 1, 2, 3 and 4 are correct
b) 1, 2 and 3 are correct, 4 is false
c) 1 and 2 are correct, 3 and 4 are false
d) 1and 3 are correct, 2 and 4 are false

40.1.1.2 (2525)
In the initial phase of flight training the relationship between confidence and expertise can be described as:

a) the pilot is competent enough to fly the aircraft at this stage, but does neither have a great deal of confidence in his/her abilities nor in the whole system
b) the pilot is sufficiently competent to fly and knows at this stage what he can and cannot do
c) during this learning stage, the pilot is very near to achieving full potential knowledge of the machine
d) the pilot has a sphere of expertise wich is reduced to daily use of his skills

40.1.1.2 (2526)
A pilot is skilled when he :-1 : trains or practises regularly-2 : knows how to manage himself/herself-3 : possesses all the knowledge associated with his aircraft-4 : knows how to keep resources in reserve for coping with the unexpected
a) 1,2,4
b) 1,2,3,4
c) 1,2
d) 2, 3,4

40.1.2.0 (2527)
The rate of accidents in commercial aviation (excluding sabotage and acts of terrorism) :
a) is approximatively 1 accident per million airport movements
b) has improved considerably over the last fifteen years
c) is a long way short of the safety level of road transport
d) represents about fifty accidents around the world every year

40.1.2.0 (2528)
As a cause of accidents, the human factor
a) is cited in approximately 70 - 80 % of aviation accidents
b) has increased considerably since 1980 - the percentage of accident in which this factor has been involved has more than tripled since this date
c) which is cited in current statistics, applies to the flight crew and ATC only
d) plays a negligible role in commercial aviation accidents. It is much more important in general aviation

40.1.2.0 (2529)
What airplane equipment marked a subtantial decrease in hull loss rates in the eighties?
a) GPWS
b) DME
c) SSR
d) TCAS

40.1.2.0 (2530)
In civil air transport, linear accelerations (Gx):- 1 : do not exist- 2 : have slight physiological consequences- 3 : may, in the case of pull-out, lead to loss of consciousness- 4 : cause sensory illusions on the pitch axis
a) 2,4
b) 1
c) 3,4
d) 3

40.1.3.0 (2531)
Thinking on human reliability is changing.
a) Human errors are now considered as being inherent to the cognitive function of human and are generally inescapable
b) Human errors can be avoided. All it takes is to be vigilant and to extend one's knowledge
c) The individual view of safety has gradually replaced the systemic view of safety
d) It is thought that it will be possible to eliminate errors in the near future

40.1.3.0 (2532)
Between which components is an interface mismatch causing an error of interpretation by using an old three-point altimeter?
a) Liveware - Hardware
b) Liveware - Software
c) Liveware - Environment
d) Liveware - Liveware

40.1.3.0 (2533)
Between which components is an interface mismatch responsible for deficiencies in conceptual aspects of warning systems?
a) Liveware - Software
b) Liveware - Hardware
c) Liveware - Environment
d) Liveware - Liveware

40.1.3.0 (2534)
Between which components is an interface mismatch causing disturbance of the biological rhythm, thus leading to reduced human peformance?
a) Liveware - Environment
b) Liveware - Hardware
c) Liveware - Software
d) Liveware - Liveware

40.1.3.0 (2535)
The errors resulting from an irrational indexing system in an operations manual are related to an interface mismatch between
a) Liveware - Software
b) Liveware - Hardware
c) Liveware - Environment
d) Liveware - Liveware

40.2.1.0 (2536)
Man possesses a system for maintaining his internal equilibrium in the face of variations brought about by external stimulations.This internal equilibrium is called :
a) Homeostasis
b) Heterostasis
c) Isothermy
d) Metastasis

40.2.1.1 (2537)
The earth's atmosphere consists of different gases in various concentration. Match

the following:1 nitrogen A 0,03%2 oxygen B 0,92%3 carbon dioxide C 20.95%4 rare gas D 78,10%
a) 1D, 2C, 3A, 4B
b) 1B, 2A, 3D, 4C
c) 1C, 2B, 3A, 4D
d) 1D, 2C, 3B, 4A

40.2.1.1 (2538)
Gases of physiological importance to man are:
a) oxygen and carbon dioxide
b) nitrogen and carbon dioxide
c) oxygen and carbon monoxide
d) oxygen, nitrogen and water vapor

40.2.1.1 (2539)
The volume percentage of oxygen in the atmosphere is 21% which
a) is constant for all altitudes conventional airplanes can reach
b) decreases with increasing altitude
c) increases with increasing altitude
d) is dependent on the present air pressure

40.2.1.1 (2540)
The following applies for the physical properties of gases:
a) at sea-level a gas has 1/3 of the volume it would have at 27000 ft
b) at an altitude of 18 000 ft a gas volume is three times as large as it would be at sea-level
c) a water vapor saturated gas at 34 000 ft has 6 times its volume as it would have at sea-level
d) at an altitute of 63 000 ft water will boil at temperature of 65°C

40.2.1.1 (2541)
The percentage of oxygen in the air at an altitude of approximately 34 000 ft is :
a) 21%
b) 5%
c) 10,50%
d) 42%

40.2.1.1 (2542)
The atmospheric gas pressure
a) drops faster at lower altitudes in comparison to the same altitude changes at higher altitudes
b) rises with altitude
c) decreases linear with altitude
d) decreases slower at lower altitudes compared with higher levels and equivalent altitude changes

40.2.1.1 (2543)
A certain amount of water vapor saturated air (i.e. intestinal gases) is transported from sea-level up to 34 000 ft. In the same amount of dry air, the volume of this gas is :
a) larger
b) smaller
c) constant
d) first larger, then smaller

40.2.1.1 (2544)
You can survive at any altitude, provided that
a) enough oxygen, pressure and heat is available
b) 21% oxygen is available in the air you breath in
c) pressure respiration is guaranteed for that altitude
d) the temperature in the cabin does not drop below 10"" C

40.2.1.1 (2545)
Fatigue and permanent concentration
a) lower the tolerance to hypoxia
b) increase the tolerance to hypoxia
c) do not affect hypoxia at all
d) will increase the tolerance to hypoxia when flying below 15 000 feet

40.2.1.1 (2546)
The atmosphere contains the following gases:
a) 78% nitrogen, 21% oxygen, 0,03% carbon dioxide, rest: rare gases
b) 78% nitrogen, 21% oxygen, 1% carbon monoxide, rest: rare gases
c) 78% helium, 21% oxygen, 1% carbon monoxide, rest: rare gases
d) 78% helium, 21% oxygen, 0,03% carbon dioxide, rest: rare gases

40.2.1.1 (2547)
An increase in the amount of carbon dioxide in the blood leads to:
a) shortness of breath
b) a decrease of acidity in the blood
c) a reduction of red blood cells
d) an improving resistance to hypoxia

40.2.1.1 (2548)
The total pressure of a mixture of gases is equal to the sum of the partial pressures of the gases which compose the mixture corresponds to:
a) Dalton´s law
b) Graham´s law
c) Henry`s law
d) Boyle Mariotte´s law

40.2.1.1 (2549)
The chemical composition of the earth´s atmosphere (I C A O standard atmosphere) is
a) 78 % nitrogen, 21 % oxygen, 0,9 % argon, 0,03 % carbon dioxide
b) 78 % nitrogen, 21 % oxygen, 0,9 % carbon dioxide, 0,03 % argon
c) 78 % nitrogen, 28 % oxygen, 0,9 % carbon dioxide, 0,03 % argon
d) 71 % nitrogen, 28 % oxygen, 0,9 % argon, 0,03 % carbon dioxide

40.2.1.1 (2550)
According to the I.C.A.O. standard atmosphere, the temperature lapse rate of the troposphere is approximately

a) - 2 °C every 1000 feet
b) 10 °C every 100 feet
c) 2 °C every 1000 metres
d) constant in the troposphere

40.2.1.1 (2551)
The barometric pressure has dropped to 1/2 of the pressure at sea level at
a) 18 000 feet
b) 10 000 feet
c) 25 000 feet
d) 30 000 feet

40.2.1.1 (2552)
The atmospheric pressure at 18,000 feet altitude is half the atmospheric pressure at sea level.In accordance with this statement,
a) the partial oxygen pressure at that altitude will also drop to 1/2 of the pressure of oxygen at sea level
b) the oxygen saturation of the blood at that altitude will drop by 50 % too
c) the oxygen percentage of the air at that altitude will drop by one half also
d) the partial oxygen pressure at that altitude will be doubled

40.2.1.1 (2553)
The volume percentage of oxygen in the atmosphere at 30.000 feet remains at 21 %, but the partial pressure of oxygen :
a) decreases with decreasing barometric pressure
b) remains constant, independent from altitude
c) increases by expansion
d) decreases significantly with lower temperatures

40.2.1.1 (2554)
Which data compose the ICAO standard atmosphere ?1. Density2. Pressure3. Temperature4. Humidity
a) 1,2 ,3
b) 1, 2 ,4
c) 2,3 ,4
d) 3 , 4

40.2.1.1 (2555)
Boyle's law is directly applicable in case of:
a) the expansion of trapped gasses in the human body with increasing altitude
b) the occurance of decompression sickness at high altitude
c) the occurance of hypoxia with increasing altitude
d) hyperventilation with increasing altitude

40.2.1.1 (2556)
Dalton's law explains the occurance of :
a) altitude hypoxia
b) bends
c) decompression sickness
d) creeps

40.2.1.1 (2557)
Henry's Law explains the occurence of:
a) decompression sickness
b) diffusion
c) hyperventilation
d) hypoxia

40.2.1.1 (2558)
Oxygen, combined with hemoglobin in blood is transported by
a) red blood cells
b) platelets
c) blood plasma
d) white blood cells

40.2.1.2 (2559)
The respiratory process consists mainly of
a) the diffusion of oxygen through the respiratory membranes into the blood, transportation to the cells, diffusion into the cells and elimination of carbon dioxide from the body
b) the transportation of oxygen to the cell and the elimination of carbon monoxide
c) the transportation of oxygen to the cell and the elimination of nitrogen
d) the transportation of carbon dioxide to the cell and elimination of oxygen

40.2.1.2 (2560)
Inhaling carbon monoxide can be extremely dangerous during flying. Which of the following statement(s) is/are correct?
a) Carbon monoxide is odourless and cannot be smelled.
b) Carbon monoxide increases the oxygen saturation in the blood.
c) With increasing altitude the negative effects of carbon monoxide poisoning will be compensated.
d) Small amounts of carbon monoxide are harmless.

40.2.1.2 (2561)
Carbon monoxide poisoning
a) is more likely to occur in aeroplanes where the cabin heat is technically supplied by coating the exhaust
b) is more likely to occur in aeroplanes with twin-engines because of high engine efficiency
c) only occurs in jet-driven aeroplanes
d) occurs only above 15 degrees OAT

40.2.1.2 (2562)
In the following list you will find several symptoms listed for hypoxia and carbon monoxide poisoning. Please mark those referring to carbon monoxide poisoning.
a) Headache, increasing nausea, dizziness.
b) High levels of arousal, increased error proneness, lack of accuracy.
c) Euphoria, accomodation problems, blurred vision.
d) Muscular spasms, mental confusion, impairment of hearing.

40.2.1.2 (2563)
A pilot, climbing in a non-pressurised aircraft and without using supplemental oxygen will pass the ""critical threshold"" at approximately:

a) 22 000 ft
b) 16 000 ft
c) 18 000 ft
d) 38 000 ft

40.2.1.2 (2564)
Breathing 100% will lift the pilot's physiological safe altitude to approximately:
a) 38 000 ft
b) 10 000
c) 22 000 ft
d) 45 000 ft

40.2.1.2 (2565)
The most dangerous symptoms of hypoxia at altitude are
a) euphoria and impairment of judgement
b) hyperventilation
c) sensation of heat and blurred vision
d) breathlessness and reduced night vision

40.2.1.2 (2566)
When consciously breathing fast or hyperventilating due to high arousal or overstress, the carbon dioxide level in the blood is lowered, resulting in:
a) less oxygen to be diffused into the cells
b) a poor saturation of oxygen in the blood
c) a delay in the onset of hypoxia when flying at high altitudes
d) the activation of the respiratory centre, which in turn causes hypoxia

40.2.1.2 (2567)
With hyperventilation, caused by high levels of arousal or overstress:
a) an increased amount of carbon dioxide is exhaled causing muscular spasms and even unconsciousness
b) finger nails and lips will turn blue (""cyanosis"")
c) more oxygen will reach the brain
d) peripherical and scotopic vision will be improved

40.2.1.2 (2568)
Breathing 100% oxygen at 38000 ft is equivalent to breathe ambient air at :
a) 10 000 ft
b) 8 000 ft
c) 14 000 ft
d) 18 000 ft

40.2.1.2 (2569)
At what altitude (breathing 100% oxygen without pressure) could symptoms of hypoxia be expected?
a) Approximately 38 - 40 000 ft.
b) Approximately 10 - 12 000 ft.
c) 22 000 ft
d) Approximately 35 000 ft.

40.2.1.2 (2570)
To safely supply the crew with oxygen, at which altitude is it necessary to breathe 100% oxygen plus pressure after a rapid decompression ?
a) Approximately 38 000 ft.
b) Approximately 14 000 ft.
c) Approximately 20 000 ft.
d) Approximately 45 000 ft.

40.2.1.2 (2571)
When the pilot suffers from hypothermia (loss of cabin heating):
a) his need for oxygen will be increased as long as he stays conscious
b) his oxygen need will not be affected
c) his oxygen need will be reduced giving him a better tolerance to hypoxia at higher altitudes
d) his oxygen need will be raised and his tolerance to hypoxia will be increased

40.2.1.2 (2572)
""Tunnel vision"" (loss of peripherical vision) can be observed if a pilot is subjected to more than:
a) + 3.5 Gz
b) - 3.5 Gz
c) + 3.5 Gx
d) - 3.5 Gy

40.2.1.2 (2573)
""Grey out"" can be observed if a pilot is subjected to more than:
a) + 3 Gz
b) - 3 Gz
c) + 3 Gx
d) + 3 Gy

40.2.1.2 (2574)
The negative (radial) acceleration of an airplane affects the sitting pilot with inertia along :
a) the vertical body axis upwards
b) the vertical body axis downwards
c) the transverse body axis to the right
d) the transverse body axis to the left

40.2.1.2 (2575)
How can a pilot increase his tolerance to +Gz ?
a) Tightening of muscles, ducking the head and perform a kind of pressure breathing.
b) Tighten shoulder harness.
c) Take an upright seat position.
d) Relax the muscles, ducking the head and lean upper body forward.

40.2.1.2 (2576)
Oxygen in the blood is primarily transported by
a) the hemoglobin in the red blood cells
b) the blood plasma

c) attaching itself to the hemoglobin in the red blood plasma
d) attaching itself to the hemoglobin in the white blood cells

40.2.1.2 (2577)
Large amounts of carbon dioxide are eliminated from the body when hyperventilating. This causes the blood
a) to become more alkaline increasing the amount of oxygen to be attached to the hemoglobin at lung area
b) to turn more acid thus eliminating more oxygen from the hemoglobin
c) to accelerate the oxygen supply to the brain
d) not to change at all

40.2.1.2 (2578)
Hypoxia is caused by
a) reduced partial oxygen pressure in the lung
b) reduced partial pressure of nitrogen in the lung
c) an increased number of red blood cells
d) a higher affinity of the red blood cells (hemoglobin) to oxygen

40.2.1.2 (2579)
Hypoxia can be caused by:1. low partial pressure of oxygen in the atmosphere when flying at high altitudes without pressurisation and supplemental oxygen2. a decreased saturation of oxygen in the blood due to carbon monoxide attached to the hemoglobin3. blood pooling in the lower extremities due to inertia (+ Gz)4. malfunction of the body cells to metabolize oxygen (i.e. after a hangover)
a) 1, 2, 3 and 4 are correct
b) 1 and 2 are correct, 3 and 4 are false
c) 1 is false, 2, 3 and 4 are correct
d) 1, 2, 3 are correct, 4 is false

40.2.1.2 (2580)
A pilot will get hypoxia
a) after decompression at high altitude and not taking additional oxygen in time
b) after decompression to 30 000 feet and taking 100 % oxygen via an oxygen mask
c) if his rate of climb exceeds 5 000 ft/min
d) if he is flying an unpressurized airplane at an altitude of 15 000 feet and breathing 100 % oxygen

40.2.1.2 (2581)
Why is hypoxia especially dangerous for pilots flying solo?
a) Since the first signs of hypoxia are generally hard to detect (hypoxia of the brain), the solo pilot may not be able to react in time (i.e. activate his emergency oxygen system)
b) Hypoxia does not cause a loss of control in steering the plane.
c) Hypoxia improves vision at night, so the pilot will have no indication of danger.
d) The pilot may loose control when he is using the oxygen mask.

40.2.1.2 (2582)
In the following list you find some symptoms for hypoxia and carbon monoxide poisoning. Please mark those indicating hypoxia:
a) Visual disturbances, lack of concentration, euphoria.
b) Nausea and barotitis.
c) Dull headache and bends.
d) Dizziness, hypothermia.

40.2.1.2 (2583)
Which of the following is a/are symptom(s) of hypoxia ?
a) Lack of concentration, fatigue, euphoria
b) Pain in the joints
c) Low blood pressure
d) Excessive rate and depth of breathing combined with pains in the chest area

40.2.1.2 (2584)
A symptom comparison for hypoxia and hyperventilation is:
a) cyanosis (blue color of finger-nail and lips) exists only in hypoxia
b) there are great differences between the two
c) altitude hypoxia is very unlikely at cabin pressure altitudes above 10 000 ft
d) symptoms caused by hyperventilation will immediately vanish when 100% oxygen is given

40.2.1.2 (2585)
Which statement applies to hypoxia?
a) sensitivity and reaction to hypoxia varies from person to person
b) carbon monoxide increases the tolerance of the brain to oxygen deficiency
c) you may become immune to hypoxia when exposed repeatedly to hypoxia
d) it is possible to prognose when, how and where hypoxia reaction starts to set in

40.2.1.2 (2586)
Hypoxia can also be caused by
a) a lack of red blood cells in the blood or decreased ability of the hemoglobin to transport oxygen
b) a lack of nitrogen in ambient air
c) too much carbon dioxide in the blood
d) increasing oxygen partial pressure used for the exchange of gases

40.2.1.2 (2587)
Which symptom of hypoxia is the most dangerous for conducting safe flight ?
a) The interference of reasoning and perceptive functions.
b) Dizziness.
c) Lack of adaptation.
d) Lack of accomodation.

40.2.1.2 (2588)
Which of the following applies to carbon monoxide poisoning?
a) Several days are needed to recuperate from a carbon monoxide poisoning.
b) A very early symptom for realising carbon monoxide poisoning is euphoria.
c) The human body shows no sign of carbon monoxide poisoning.
d) Inhaling carbon monoxide leads to hyperventilation.

40.2.1.2 (2589)
The momentum of gas exchange in respiration is
a) dependent on the pressure gradient between the participating gases during

<u>respiration</u>
b) the excess pressure caused by inhaling
c) independent from the partial pressures of the participating gases
d) depending on the active transportation of nitrogen into the alveoli

40.2.1.2 (2590)
Which component(s) is/are transporting the oxygen in the blood?
<u>a) Hemoglobin in the red blood cells.</u>
b) White blood cells.
c) Plasma.
d) Blood fat.

40.2.1.2 (2591)
Affinity to hemoglobin is best with:
<u>a) carbon monoxide</u>
b) nitrogen
c) oxygen
d) carbon dioxide

40.2.1.2 (2592)
Which of the following is true concerning carbon monoxide?
<u>a) It is to be found in the smoke of cigarettes lifting up a smoker's ""physiological altitude"".</u>
b) It combines 5 times faster to the hemoglobin than oxygen.
c) It has no physiological effect when mixed with oxygen.
d) It is always present in the lungs.

40.2.1.2 (2593)
The rate and depth of breathing is primarily controlled by:
<u>a) the amount of carbon dioxide in the blood</u>
b) the amount of carbon monoxide in the blood
c) the amount of nitrogen in the blood
d) the total atmospheric pressure

40.2.1.2 (2594)
In the alveoli gas exchange takes place (external respiration). Which gas will diffuse from the blood into the lungs?
<u>a) Carbon dioxide.</u>
b) Ambient air.
c) Oxygen.
d) Carbon monoxide.

40.2.1.2 (2595)
Which statement is correct ?
<u>a) Oxygen diffusion from the blood into the cells depends on their partial oxygen pressure gradient.</u>
b) The blood plasma is transporting the oxygen.
c) The gradient of diffusion is higher at altitude than it is at sea-level.
d) Oxygen diffusion from the lungs into the blood does not depend on partial oxygen pressure.

40.2.1.2 (2596)
A good method to treat hyperventilation is to:
<u>a) talk oneself through the relevant procedure aloud to emotionally calm down and reduce the rate of breathing simultaneously</u>
b) don an oxygen mask
c) excecute the valsalva manoeuvre
d) close the eyes and relax

40.2.1.2 (2597)
What could cause hyperventilation ?
<u>a) Fear, anxiety and distress</u>
b) Abuse of alcohol
c) Extreme low rate of breathing
d) Fatigue

40.2.1.2 (2598)
A pilot who is hyperventilating for a prolonged period of time may even get unconscious. Hyperventilation is likely to occur, when:
<u>a) the pilot is emotionally aroused</u>
b) there is a low CO-pressure in the blood
c) he is flying a tight turn
d) there is an increased blood flow to the brain

40.2.1.2 (2599)
Hyperventilation can cause unconsciousness, because:
<u>a) blood circulation to the brain is slowed down</u>
b) oxygen saturation of the blood is decreased
c) not enough time is left to exchange oxygen in the lungs
d) oxygen saturation of the blood is increased and the brain will be supplied with more blood than normal

40.2.1.2 (2600)
At what altitude (""threshold for compensatory reactions"") does the human organism start with remarkable measures to compensate for the drop in pO2 when climbing?At about:
<u>a) 6000-7000 FT</u>
b) 8000-9000 FT
c) 9000-10000 FT
d) 10000-12000 FT

40.2.1.2 (2601)
Where is the ""critical threshold"" at which a pilot not using oxygen reaches the critical or lethal zone?It starts at:
<u>a) 22000 FT.</u>
b) 18000 FT
c) It25000 FT
d) It38000 FT

40.2.1.2 (2602)
Short term memory can already be affected when flying as low as:
<u>a) 8000 FT</u>

b) 12000 FT
c) 15000 FT
d) 20000 FT

40.2.1.2 (2603)
Breathing pure oxygen (without pressure) will be sufficient up to an altitude of:
a) 38000 FT
b) 45000 FT
c) 60000 FT
d) 80000 FT

40.2.1.2 (2604)
After a decompression at high altitude
a) nitrogen gas bubbles can be released in the body fluids causing gas embolism, bends and chokes
b) automatically oxygen is deployed into the cabin
c) temperature in the cockpit will increase
d) pressure differentials will suck air into the cabin

40.2.1.2 (2605)
In airline operations decompression sickness symptoms
a) may develop after a decompression from 7000 FT cabin pressure altitude to 30000 FT flight altitude
b) may develop when being decompressed from MSL to 15 000 FT
c) appear only in air crew, previously engaged in diving activities
d) may affect people with defect tympanic membrane

40.2.1.2 (2606)
Symptoms of decompression sickness
a) are bends, chokes, skin manifestations, neurological symptoms and circulatory shock
b) are only relevant when diving
c) can only develop at altitudes of more than 40000 FT
d) are flatulence and pain in the middle ear

40.2.1.2 (2607)
Decompression sickness symptoms may develop due to
a) cabin pressure loss when flying at higher altitudes (above 18000 FT)
b) sudden pressure surges in the cabin at altitudes below 18000 FT
c) emergency descents after a cabin pressure loss
d) fast flights from a high-pressure zone into a low pressure area when flying an unpressurized aeroplane

40.2.1.2 (2608)
The eustachian tube serves for the pressure equalization between
a) middle ear and external atmosphere
b) sinuses of the nose and external atmosphere
c) nose and pharyngeal cavity and external atmosphere
d) frontal, nose and maxillary sinuses

40.2.1.2 (2609)
Disturbances of pressure equalization in air-filled cavities of the head (nose, ear etc.) are called:
a) barotrauma
b) ebulism
c) hypoxia
d) hyperventilation

40.2.1.2 (2610)
Barotrauma caused by gas accumulation in the stomach and intestinals can lead to:
a) pressure pain or flatulence
b) barotitis
c) decompresion sickness
d) barosinusitis

40.2.1.2 (2611)
What counter-measure can be used against a barotrauma of the middle ear (aerotitis)?
a) Close the mouth, pinch the nose tight and blow out thereby increasing the pressure in the mouth and throat. At the same time try to swallow or move lower jaw (Valsalva)
b) Increase rate of descent
c) Stop climbing, start descent
d) Pilots should apply anti-cold remedies prior every flight to prevent barotrauma in the middle ear

40.2.1.2 (2612)
How can you determine if a person is suffering from a barotrauma of the sinuses of the nose (aerosinusitis) or the middle ear (aerotitis) ?
a) Hearing difficulties will normally accompany aerotitis
b) Aerosinusitis will never develop during descent
c) Barotrauma of the middle ear will not effect hearing
d) There is no difference

40.2.1.2 (2613)
Please mark the counter-measure a pilot can use against a barotrauma of the middle ear (aerotitis).
a) Stop descending, climb again and then descend with reduced sink rate
b) Increase the rate of descent
c) Stop chewing and swallowing movements (""Valsalva"")
d) Use drugs against a cold

40.2.1.2 (2614)
Barotrauma of the middle ear most likely will occur
a) when descending rapidly
b) during a long high altitude flight
c) when climbing
d) in sudden steep turns

40.2.1.2 (2615)
Barotrauma of the middle ear is usually accompanied by
a) a reduction in hearing ability and the feeling of increasing pressure
b) dizziness
c) noises in the ear
d) pain in the joints

40.2.1.2 (2616)
The effect of hypoxia to vision
a) is stronger with the rods
b) is usual stronger with the cones
c) can only be detected when smoking tobacco
d) does not depend on the level of illumination

40.2.1.2 (2617)
When oxygen is beeing transferred from the blood into the tissues and carbon dioxide from the body cells into the blood, it is called:
a) internal respiration
b) external respiration
c) ventilation
d) hyperventilation

40.2.1.2 (2618)
Through which part of the ear does the equalization of pressure take place, when altitude is changed?
a) Eustachian tube
b) Cochlea
c) Tympanic membrane
d) External auditory canal

40.2.1.2 (2619)
Which of the following symptoms can mark a beginning hyperventilation?
a) Dizzy feeling
b) Slow heart beat
c) Slow rate of breathing
d) Cyanosis (blueing of lips and finger nails)

40.2.1.2 (2620)
Out of the list of possible measures to counteract hyperventilation, the most effective measure against hyperventilation tetany is:
a) breathe into a plastic or paper bag
b) hold breath
c) avoid strenuous flight manoeuvres
d) speak soothingly and get the person to breathe slowly

40.2.1.2 (2621)
What event can cause a hyperventilation (not required by physical need)?1. Pressure breathing.2. Anxiety or fear.3. Overstress.4. Strong pain.5. Jogging.
a) 1,2,3 and 4 are correct, 5 is false
b) Only 2 and 3 are correct
c) 1,2,3,4 and 5 are correct
d) 1and 5 are both false

40.2.1.2 (2622)
Which of the following could a pilot experience when he is hyperventilating?1. Dizziness2. Muscular spasms3. Visual disturbances4. Cyanosis
a) 1,2 and 3 are correct, 4 is false
b) 1,2 and 4 are correct, 3 is false
c) 1 is false, all others are correct
d) 2 and 4 are false

40.2.1.2 (2623)
TUC (Time of Useful Consciousness) is:
a) the length of time during which an individual can act with both mental and physical efficiency and alertness, measured from the moment at which he is exposed to hypoxia
b) the time before becoming unconscious at a sudden pressure loss
c) the time after pressure loss until decompression sickness sets in
d) the time between the start of hypoxia and death

40.2.1.2 (2624)
The ""Effective Performance Time"" or ""Time of Useful Consciousness"" after a decompression at 35 000 ft is:
a) between 30 and 60 seconds
b) approximately 3 minutes
c) approximately 5 minutes
d) less than 20 seconds

40.2.1.2 (2625)
The time between inadequate oxygen supply and incapacitation is called TUC (Time of Useful Consciousness). It
a) varies individually and depends on cabin pressure altitude
b) is the same amount of time for every person
c) is not dependent on physical or psychological pressure
d) varies individually and does not depend on altitude

40.2.1.2 (2626)
After a decompression to 43 000 FT the TUC (Time of Useful Consciousness) will be approximately:
a) 5-15 seconds
b) 30-45 seconds
c) 45-60 seconds
d) 60-90 seconds

40.2.1.2 (2627)
Flights immediately after SCUBA-diving (compressed gas mixtures, bottles) (>10 m depth)
a) are forbidden
b) can be performed without any danger
c) are allowed, if 38000 FT are not exceeded
d) should be avoided because hypoxia may develop

40.2.1.2 (2628)
Pain in the Joints (""bends""), which suddenly appear during a flight , are symptoms of
a) decompression sickness
b) barotrauma
c) air-sickness
d) hypoxia

40.2.1.2 (2629)
After a cabin pressure loss in approximately 35 000 FT the TUC (Time of Useful Consciousness) will be approximately:
a) 30 -90 seconds
b) 10-15 seconds
c) 3-4 minutes
d) 5 minutes or more

40.2.1.2 (2630)
You suffered a rapid decompression without the appearance of any decompression sickness symptoms.How long should you wait until your next flight?
a) 12 hours
b) 24 hours
c) 36 hours
d) 48 hours

40.2.1.2 (2631)
Flying immediately following a dive with SCUBA diving equipment (> 10 m depth)
a) can cause decompression sicknesss even when flying at pressure altitudes below 18 000 FT
b) prevents any dangers caused by aeroembolism (decompression sickness) when climbing to altitudes not exceeding 30 000 FT
c) has no influence on altitude flights
d) is forbidden for the flight crew, because it leads to hypoxia

40.2.1.2 (2632)
Barotrauma of the sinuses of the nose (aerosinusitis)
a) is caused by a difference in pressure existing between the sinus cavity and the ambient air
b) is only caused by the flying sport, not by the diving sport
c) is an irritation of sinuses by abuse of nose sprays
d) is only caused by colds and their effects

40.2.1.2 (2633)
Barodontalgia
a) arises especially with irritations of the sensitive tissues close to the root of a tooth
b) arises only at higher altitudes and after decompression
c) even arises with healthy teeth
d) arises in combination with a cold and very high rates of descent

40.2.1.2 (2634)
At a high altitude flight (no cabin pressure system available), a pilot gets severe flatulence due to trapped gases. The correct counter-measure is:
a) descend to lower altitude
b) climb to a higher altitude
c) perform ""valsalva maneouvre""
d) use supplemental oxygen

40.2.1.2 (2635)
A barotrauma of the middle ear (aerotitis)
a) is more likely, when the pilot is flying with a respiratory infection and during descent
b) is only caused by large pressure changes during climb
c) causes severe pain in the sinuses
d) is to be expected during rapid decompressions, but an emergency descent immediately following the decompression will eliminate the problem

40.2.1.2 (2636)
Trapped intestinal gases can cause severe pain. When is this the case?
a) More frequent when flying above 18 000 FT in a non-pressurized aircraft.
b) At lower altitudes.
c) Only in pressurized aircraft when flying at higher flight levels.
d) During descent as well as during climb, when the cabin pressure altitude is exceeding 2 000 FT

40.2.1.2 (2637)
The risk of a barotrauma of the middle ear is more likely to occur
a) with colds and rapid descents
b) with colds and fast climbs
c) with colds and slow ascents
d) after a decompression

40.2.1.2 (2638)
Equalization of pressure is limited between the middle ear and the ambient, when:
a) the eustachian tube is blocked
b) the nose is pinched
c) you breath through the mouth
d) barotrauma exists in the sinuses

40.2.1.2 (2639)
A barotrauma of the middle ear is
a) an acute or chronic trauma of the middle ear caused by a difference of pressure on either side of the eardrum
b) a bacterial infection of the middle ear
c) a dilatation of the eustachian tube
d) an infection of the middle ear caused by rapid decompression

40.2.1.2 (2640)
The eustachian tube is the passage way between the
a) nasopharynx and the middle ear
b) nose, pharynx and inner ear
c) nose, pharynx and the external auditory canal
d) sinuses and the pharynx

40.2.1.2 (2641)
Which part of the ear could be affected due to air pressure changes during climb and/or descent?
a) The eustachian tube and the tympanic membrane (ear drum)
b) The semicircular canals
c) The cochlea
d) The sacculus and utriculus

40.2.1.2 (2642)
Hypoxia effects visual performance.A pilot may:
a) get blurred and/or tunnel vision
b) have a reduction of 25% in visual acuity at 8000 FT AGL
c) be unable to maintain piercing vision below 5000 FT AGL
d) get colour blindness accompanied by severe headache

40.2.1.2 (2643)
Which of the following symptoms could a pilot get, when he is subjected to hypoxia?1. Fatigue.2. Euphoria.3. Lack of concentration.4. Pain in the joints.5. Sensation of suffocation.
a) 1, 2 and 3 are correct
b) 4 and 5 are correct
c) 1, 2, 3 and 4 are correct
d) Only 5 is false

40.2.1.2 (2644)
In relation to hypoxia, which of the following paraphrase(s) is (are) correct?
a) This is a physical condition caused by a lack of oxygen to meet the needs of the body tissues, leading to mental and muscular disturbances, causing impaired thinking, poor judgement and slow reactions
b) This is a condition of lacking oxygen in the brain causing the circulatory system to compensate by decreasing the heart rate.
c) Hypoxia is often produced during steep turns when pilots turn their heads in a direction opposite to the direction in which the aircraft is turning
d) This is a physical condition caused by a lack of oxygen saturation in the blood while hyperventilating.

40.2.1.2 (2645)
Hyperventilation is due to an excessive rate of breathing and can produce the following symptoms:
a) dizziness, tingling sensation in the fingers and toes, nausea and blurred vision
b) reduced heart rate and increase in visual acuity
c) a state of overconfidence and reduced heart rate
d) blue finger-nails and lips

40.2.1.2 (2646)
In order to get rid of excess nitrogen following scuba diving, subsequent flights should be delayed
a) 24 hours
b) 3 hours after non decompression diving
c) 36 hours after any scuba diving
d) 48 hours after a continuous ascent in the water has been made

40.2.1.2 (2647)
The cabin pressure in airline operation is
a) normally not exceeding 6 000 to 8 000 feet
b) normally not exceeding 2 000 to 3 000 feet
c) normally not exceeding 4 000 to 5 000 feet
d) always equivalent to sea level

40.2.1.2 (2648)
The type of hypoxia, which occurs at altitude is a explained by:
a) Dalton´s law
b) Boyle Mariotte´s law
c) Henry´s law
d) Graham´s law

40.2.1.2 (2649)
Gaseous exchange in the human body depends on:1. diffusion gradients between the participating gases2. permeable membranes3. partial pressure of oxygen in the alveolus air4. acid-base balance in the blood
a) 1, 2, 3 and 4 are correct
b) 1, 2 and 3 are correct, 4 is false
c) 2 and 3 are false
d) only 1 is correct

40.2.1.2 (2650)
Hyperventilation causes
a) a lack of carbon dioxide in the blood
b) an excess of carbon dioxide in the blood
c) acidosis
d) hypochondria

40.2.1.2 (2651)
Anxiety and fear can cause
a) hyperventilation
b) hypoxia
c) spatial disorientation
d) hypoglycemia

40.2.1.2 (2652)
Symptoms of decompression sickness
a) sometimes can appear with a delay after the airplane is on the ground
b) always begin immediately after the decompression during the flight
c) normally take 2 or 3 days to appear after exposure to a hypobaric atmosphere
d) disappear on landing and never appear again

40.2.1.2 (2653)
The first effect to be noticed on gradual exposure to high positive radial accelerations is
a) grey-out
b) loss of consciousness
c) black-out
d) red-vision

40.2.1.2 (2654)
Decompression sickness occurs in association with exposure to reduced atmospheric pressure.The evolution of bubbles of nitrogen coming out of solution in body tissues can be derived from:
a) Henry´s law
b) Boyle Mariotte´s law
c) Dalton´s law
d) Gay Lussac´s law

40.2.1.2 (2655)
The normal rate of breathing is
a) 20 to 30 cycles a minute
b) 12 to 16 cycles a minute
c) 32 to 40 cycles a minute
d) 60 to 100 cycles a minute

40.2.1.2 (2656)
The main function of the red blood cells is
a) to transport oxygen
b) to participate in the process of coagulation of the blood
c) the cellular defense of the organism
d) to contribute to the immune response of the organism

40.2.1.2 (2657)
Altitude-hypoxia, when breathing ambient air, should not occur (indifferent phase)
a) below 3 000 m
b) up to 5 000 m
c) between 3 000 m and 5 000 m
d) between 5 000 m and 7 000 m

40.2.1.2 (2658)
""The Bends"" as a symptom of decompression sickness consists of:
a) pain in the joints
b) pain in the thorax and a backing cough
c) CNS-disturbances
d) loss of peripheral vision

40.2.1.2 (2659)
One of the most frequent symptom(s) of decompression sickness emerging after a decompression in airline operation
a) are the bends
b) are the chokes
c) is a shock
d) are neurological damages to the CNS

40.2.1.2 (2660)
Which phenomenon is common to hypoxia and hyperventilation?
a) Tingling sensations in arms or legs.
b) Cyanosis (blueing of lips and finger-nails).
c) Severe headache.
d) Euphoria.

40.2.1.2 (2661)
1. Euphoria can be a symptom of hypoxia. 2. Someone in an euphoric condition is more prone to error.
a) 1 and 2 are both correct
b) 1 is correct, 2 is not correct
c) 1 is not correct, 2 is correct
d) 1 and 2 are both not correct

40.2.1.2 (2662)
Incapacitation caused by barotrauma from gaseous expansion after decompression at high altitude may be associated with the following part(s) of the body:1 the digestive tract2 the ears3 the eyes4 the sinuses
a) 1
b) 1,2,3
c) 2,3,4
d) 2,4

40.2.1.2 (2663)
Of the following alternatives, which objective effects are due to positive acceleration (+ Gz)?- 1: Decrease in heart rate- 2: Pooling of blood into lower parts of the body- 3: Drop in blood pressure above heart-level- 4: Downward displacement or deformation of soft or mobile organs
a) 2,3,4
b) 1,2,3
c) 1
d) 1,3,4

40.2.1.2 (2664)
What is hypoxia ?
a) Any condition where the oxygen concentration of the body is below normal limits or where the oxygen available to the body cannot be used due to some pathological condition
b) The total absence of oxygen in the air
c) The respiratory symptom associated with altitude decompression sickness
d) A state charcterised by an excessive supply of oxygen which may be due to maladjustment of the mask

40.2.1.2 (2665)
What could be symptoms of hypoxia (when flying without oxygen) above 12,000 ft?
a) Headache, fatigue, dizziness, lack of coordination
b) Headache, thirst, somnolence, collapse
c) Euphoria, headache, improvement in judgement, loss of consciousness
d) Trembling, increase in body temperature, convulsions,slowing of the rate of breathing

40.2.1.2 (2666)
You climb from 0 to 50.000 ft and measure the decrease of the pressure per 5.000 ft. The absolute difference in barometric pressure is greatest between :
a) 0 and 5.000 feet
b) 5.000 and 10.000 feet

c) 10.000 and 15.000 feet
d) 45.000 and 50.000 feet

40.2.1.2 (2667)
Physiological problems due to increasing altitude are caused by :
a) decreased atmospherical pressure
b) disorientation
c) accelerations
d) increased atmospherical pressure

40.2.1.2 (2668)
Air at an altitude of 18.000 feet contains, approximately :
a) 21% oxygen
b) 5% oxygen
c) 15% oxygen
d) 10% oxygen

40.2.1.2 (2669)
Dry air is a mixture of gases. Their volume percentage is about:
a) 21% oxygen,78% nitrogen, 1% other gases
b) 18% oxygen, 80% nitrogen, 2% other gases
c) 19% oxygen, 80% nitrogen, 1% other gases
d) 25% oxygen, 74% nitrogen, 1% other gases

40.2.1.2 (2670)
The occurrence of pain in the joints (bends) during decompression can be explained by the principle that:
a) the quantity of a gas dissolved in a fluid is proportional to the pressure of that gas above the fluid (Henry's Law)
b) a volume of gas is inversely proportional to the pressure of this gas at constant temperature (Boyle's law)
c) the total pressure of a mixture of gases is equal to the sum of the partial pressures of the separate gases (Dalton's Law)
d) the molecules of a gas will move from an area of higher concentration or partial pressure to an area of lower concentration or partial pressure (law of diffusion)

40.2.1.2 (2671)
Pain in the joints caused by gas bubbles following a decompression is called:
a) bends
b) chokes
c) creeps
d) leans

40.2.1.2 (2672)
What are the main clinical signs of hypoxia during explosive decompression ?
a) Increase in heart and respiratory rates, euphoria, impairment of judgement, memory disorders
b) Headaches, fatigue, somnolence, palpitations
c) Increase in heart rate, decrease in body temperature impairment of judgement
d) Headaches, articular pain, speeding-up of the respiratory rate, memory disorders

40.2.1.2 (2673)
Which is the procedure to be followed when symptoms of decompression sickness occur?
a) Descend to the lowest possible level and land as soon as possible
b) Descend to the lowest possible level and wait for the symptoms to disappear before climbing again
c) Only medical treatment is of use
d) Only the prompt supply of oxygen is necessary

40.2.1.2 (2674)
What is decompression sickness ?
a) An sickness resulting from the formation of nitrogen bubbles in bodily tissues and fluids after a cabin pressure loss at high altitude
b) A frequent disorder in commercial aviation due to the pressurisation curve of modern aircraft
c) A disorder which is solely encountered below 18,000 ft
d) The formation of air bubbles in bodily tissues, with no consequences for people's capabilities

40.2.1.2 (2675)
Which of the following statements are correct:-1: Scuba diving may be practiced without restriction-2: Many medicines have effects which are incompatible with flight safety-3: An adequate amount of fluid should be drunk when flying-4: Diet has no repercussion on health
a) 2 and 3 are correct
b) 1, 2 and 3 are correct
c) 2, 3 and 4 are correct
d) 1, 3 and 4 are correct

40.2.1.2 (2676)
A pressurized cabin helps to prevent:1. decompression sickness2 .the problem of expansion of gases in the intestines3. hypoxia4. coronary desease
a) 1, 2 and 3 are correct.
b) 1, 2 and 4 are correct.
c) 2, 3 and 4 are correct.
d) 1, 3 and 4 are correct.

40.2.1.2 (2677)
Healthy people are usually capable to compensate for a lack of oxygen up to
a) 10.000 - 12.000feet
b) 15.000 feet
c) 20.000 feet
d) 25.000 feet

40.2.1.2 (2678)
When flying above 10.000 feet hypoxia arises because:
a) the partial oxygen pressure is lower than at sea level.
b) the composition of the blood changes
c) the composition of the air is different from sea level
d) the percentage of oxygen is lower than at sea level

40.2.1.2 (2679)
Saturation of oxygen in the blood at sea level is 98%. This saturation decreases with:1. decreasing air pressure2. carbon monoxide poisoning3. increasing altitude4. increasing air pressure
a) 1, 2 and 3 are correct, 4 is false
b) 1, 2 and 4 are correct, 3 is false
c) 2, 3 and 4 are correct, 1 is false
d) 1, 3 and 4 are correct, 2 is false

40.2.1.2 (2680)
Hypoxia is a situation in which the cells
a) have a shortage of oxygen
b) are saturated with nitrogen
c) are saturated with oxygen
d) have a shortage of carbon dioxide

40.2.1.2 (2681)
The severity of hypoxia depends on the:1. rate of decompression2. physical fitness3. flight level4. individual tolerance
a) 1,2,3 and 4 are correct
b) 1,2 and 3 are correct, 4 is false
c) 2,3 and 4 are correct, 1 is false
d) 1 and 3 are correct, 2 and 4 are false

40.2.1.2 (2682)
Which of the following statements concerning hypoxia is correct?
a) It is a potential threat to safety.
b) It is never a problem at altitudes below 25.000 ft.
c) It activates the senses and makes them function better.
d) It has little effect on the body, because the body can always compensate for it.

40.2.1.2 (2683)
Early symptoms of hypoxia could be: 1. euphoria 2. decreased rate and depth of breathing 3. lack of concentration 4. visual disturbances
a) 1,3 and 4 are correct
b) 1,2,3 and 4 are correct
c) 1,2 and 3 are correct
d) 1,2 and 4 are correct

40.2.1.2 (2684)
One of the most dangerous symptoms of hypoxia concerning flight safety is:
a) impaired judgement, disabling the pilot to recognize the symptoms
b) reduced coordination of limb movements, causing the pilot to spin
c) cyanosis, reducing then pilots ability to hear
d) hyperventilation, causing emotional stress

40.2.1.2 (2685)
Which of the following symptoms can indicate the beginning of hypoxia?1. Blue lips and finger nails.2. Euphoria.3. Flatulence.4 .Unconsciousness..
a) 1, 2 and 4 are correct.
b) 1, 2 and 3 are correct.
c) 2, 3 and 4 are correct.
d) 1, 3 and 4 are correct.

40.2.1.2 (2686)
Among the functions below, which is the most sensitive to hypoxia?
a) Night vision.
b) Motor coordination.
c) Hearing.
d) Speech.

40.2.1.2 (2687)
You are crossing the Alps in a non-pressurised aircraft at an altitude of 15.000 feet. You do not use the oxygen mask because you feel fine. This is unsafe, because:
a) your judgement could be impaired
b) the blood-pressure can get too high
c) the blood-pressure can get too low
d) you will get the bends

40.2.1.2 (2688)
During a night flight at 10,000 feet you notice that your acuity of vision has decreased. In this case you can increase your acuity by:
a) breathing extra oxygen through the oxygen mask.
b) closing one eye
c) scanning sectors of the field of vision
d) dim the instrument lights

40.2.1.2 (2689)
During flight all crewmembers have one or more of the following symptoms: 1. blue lips 2. mental disturbances 3. tingling sensations in arms and/or legs 4. reduction of peripheral visionWhich is the possible cause?
a) Hypoxia.
b) Glaucoma.
c) Hypothermia.
d) Hypoglycaemia.

40.2.1.2 (2690)
Which measure(s) will help to compensate hypoxia?1. Descend below 10 000 FT.2. Breathe 100 % oxygen.3. Climb to or above 10 000 FT.4. Reduce physical activities.
a) 1, 2 and 4 are correct
b) 1, 2 and 3 are correct
c) only 1 is correct
d) 1 and 2 are correct, 3 and 4 are false

40.2.1.2 (2691)
Hypoxia can be prevented when the pilot
a) is using additional oxygen when flying above 10.000 feet
b) is relying on the body's built in warning system recognizing any stage of hypoxia
c) is swallowing, yawing and applying the Valsalva method
d) will not exceed 20 000 FT cabin pressure altitude

40.2.1.2 (2692)
Hypoxia can occur because:
a) you are hyperventilating
b) you are getting toomuch solar radiation
c) you inhale too much nitrogen
d) the percentage of oxygen is lower at altitude

40.2.1.2 (2693)
You should not despense blood without prior information from your flight surgeon. The most important reason for this advise is:
a) you are more susceptible to hypoxia after a blood-donation.
b) the chance you get the bends is higher after blood-donation
c) your blood-pressure is too low after blood-donation
d) your heart frequency is too low after blood-donation

40.2.1.2 (2694)
Hyperventilation is:
a) an increased lung ventilation
b) a too high percentage of nitrogen in the blood
c) a decreased lung ventilation
d) a too high percentage of oxygen in the blood.

40.2.1.2 (2695)
Hyperventilation is:
a) a normal compensatory physiological reaction to a drop in partial oxygen pressure (i.e. when climbing a high mountain)
b) an accellerated heart frequency caused by an increasing blood pressure
c) an accellerated heart frequency caused by a decreasing blood-pressure
d) a reduction of partial oxygen pressure in the brain

40.2.1.2 (2696)
What is the procedure above 10.000 ft altitude when faced with explosive decompression?
a) Don an oxygen mask and descend to below 10,000 ft
b) First inform ATC
c) Descend to below 10,000 ft and signal an emergency
d) Check the cabin altitude, don an oxygen mask and maintain level flight

40.2.1.2 (2697)
What is the average Time of Useful Consciousness after a rapid decompression at 40,000 ft ?
a) About 12 seconds
b) Between 20 seconds and 1 minute
c) About 40 secods
d) More than 1 minute

40.2.1.2 (2698)
What is the Time of Useful Consciouness ?
a) The length of time during which an individualcan act with both mental and physical efficiency and alertness, measured from the moment at which he loses his available oxygen supply
b) The time taken to become aware of hypoxia due to gradual decompression
c) The pilot's reaction time when faced with hypoxia
d) The period of time between the start of hypoxia and the moment that the pilot becomes aware of it

40.2.1.2 (2699)
Which of the folllowing statements concerning barotrauma are correct? They are:
a) due to pressure differentials between gases in hollow cavities of the body and the ambient pressure
b) caused by an increase in the partial pressure of oxygen associated with a decrease in altitude
c) more likely to occur during ascent then during a rapid descent
d) mainly associated with a sink rate which exceeds the ability of the body to balance its internal pressures

40.2.1.2 (2700)
Decompression sickness may occur as from :- 1: an altitude of more than 18,000 ft- 2 : an altitude of more than 5,500 ft- 3 : a rate of climb of more than 500 ft/min exceeding 18,000 ft- 4 : a temperature of more than 24°C
a) 1,3
b) 2,3
c) 1,3,4
d) 2,4

40.2.1.2 (2701)
With regard to decompression sickness associated with flight, we know that :
a) age, obesity and scuba diving are risk factors
b) scuba diving does not pose any problem for a subsequent flight
c) sex is the prime risk factor, with two out of every three women being sensitive to it
d) physical activity after decompression reduces the risks of decompression sickness symptoms to appear

40.2.1.2 (2702)
The procedure to be followed in the event of decompression when flying above 10,000 ft must :
a) allow for the rapid supply of oxygen in order to prevent the pilot becoming hypoxic
b) allow for a rapid descent independent from sufficient supply of oxygen in order to prevent disorders due to hypoxia
c) make it possible to prevent hyperventilation owing to the inhalation of 100 % oxygen
d) make it possible to eliminate the risk of fogging due to the sudden pressure changes

40.2.1.2 (2703)
What is the ""Time of Useful Consciousness"" for a rapid decompression at 25,000 ft ?
a) Between 3 and 5 minutes depending on the physical activities of the subjected pilot
b) About 18 seconds
c) Between 25 seconds and 1 minute 30 seconds
d) About 30 seconds

40.2.1.2 (2704)
A passenger complains about a painful inflated belly at 8.000 feet. You advise him to:1. unbuckle and massage the belly2. stand up and let go the gases out of the intestines3. eat less gas forming food and avoid carbonhydrated beverages before flight in the future4. drink a lot of water throughout the flight
a) 1, 2 and 3 are correct
b) 2, 3 and 4 are correct
c) 1 and 3 not advisable
d) only 4 is correct

40.2.1.2 (2705)
On ascent the gases in the digestive tract will
a) expand
b) stay the same
c) shrink
d) be absorbed by tissues and blood

40.2.1.2 (2706)
Pain in the middle ear during descent may be eased by:
a) leveling off and possibly climbing
b) blocking the effected ear with the palm of your hand
c) increasing the rate of descent
d) using an oxygen mask

40.2.1.2 (2707)
The Time of Useful Consciousness may vary according to :1 : physical activity of the subjected crew2 : the experience of the pilot on the type of aircraft in question3 : the strength and time of decompression4 : the cabin temperature
a) 1,3
b) 1,2
c) 3,4
d) 4

40.2.1.2 (2708)
During a climb, we can observe the following with regard to the partial oxygen pressure :
a) an identical decrease to that for atmospheric pressure
b) a decrease which is three times faster than the decrease in atmospheric pressure
c) an increase up to 10,000 ft followed by a sudden pressure drop above that altitude
d) an increase which is inversely proportional to the decrease in atmospheric pressure

40.2.1.2 (2709)
The following may occur during gradual depressurisation between 12,000 and 18,000 ft :
a) a loss of coordination associated with fatigue and headache
b) a rapid decrease in blood pressure which will lead to headache and also to a loss of coordination
c) sudden visual hyperacuity associated with headache
d) a rapid decrease in blood pressure leading to considerable somnolence

40.2.1.2 (2710)
What is the main problem caused by positive (+Gz) accelerations?
a) A pooling of blood in the lower portions of the body, and hence less blood available
b) An improvement of peripheral vision
c) An increase in blood pressure in the upper part of the body (above heart-level)
d) Hyperoxygenation of the blood which may lead to sensory disorders

40.2.1.2 (2711)
What type of acceleration has the most significant physiological effect upon the pilot?
a) Radial acceleration (+ Gz)
b) Linear acceleration (+ Gx)
c) Transverse acceleration (+ Gy)
d) Combined linear and transverse acceleration

40.2.1.2 (2712)
Under normal circumstances, which gas will diffuse from the blood to the alveoli:
a) carbon dioxide
b) carbon monoxide
c) nitrogen
d) oxygen

40.2.1.2 (2713)
In the pulmonary artery there is :
a) oxygen poor and carbon dioxide rich blood
b) oxygen poor and carbon dioxide poor blood
c) oxygen rich and carbon dioxide poor blond
d) oxygen rich and carbon dioxide rich blood

40.2.1.2 (2714)
The thin walls of capillaries are permeable for :
a) gases
b) platelets
c) protein
d) red blood cells

40.2.1.2 (2715)
The circulatory system, among other things, allows for :1. transportation of oxygen and carbon dioxide2. transportation of information by chemical substances
a) 1 and 2 are correct
b) 1 is correct and 2 is false
c) 1 is false and 2 is correct
d) both are false

40.2.1.2 (2716)
The part of blood without cell is called :
a) plasm
b) lymph
c) serum
d) water

40.2.1.2 (2717)
Haemoglobin is:
a) in the red blood cells
b) in the platelets
c) dissolved in the plasma
d) in the white blood cells

40.2.1.2 (2718)
Someone who has anaemia has:
a) not enough functional hemoglobin
b) not enough platelets
c) not enough plasma
d) not enough white blood cells

40.2.1.2 (2719)
The average pulse of a healthy adult in rest is about:
a) 60 to 80 beats/min
b) 30 to 50 beats/min
c) 90 to 100 beats/min
d) 110 to 150 beats/min

40.2.1.2 (2720)
Pulse rate is influenced by the following factors:1. Adrenalin2. Cortisol3. Physical exercise.4. Glucose concentration in the blood
a) 1,3 and 4 are correct, 2 is false
b) 1,2,3 and 4 are correct
c) 2,3 and 4 are correct, 1 is false
d) 1,2 and 4 are correct, 3 is false

40.2.1.2 (2721)
With a heart rate of 72 beats per minute and a stroke volume of 70 ml the cardial output is about:
a) 5 liters/min
b) 6 liters/min
c) 7 liters/min
d) 8 liters/min

40.2.1.2 (2722)
At rest the cardial output (the quantity of blood the heart pumps in one minute) of an adult is approximately:
a) 5 liters/min
b) 450 ml/min
c) 45 liters/min
d) 75 liters/min

40.2.1.2 (2723)
The heart muscle is supplied with blood from:
a) the coronary arteries
b) the auricles
c) ventricles
d) the pulmonary veins

40.2.1.2 (2724)
The normal arterial blood-pressure of a healthy adult is (systolic/diastolic):
a) 120/80 mm Hg
b) 80/20 mm Hg
c) 180/120 mm Hg
d) 220/180 mm Hg

40.2.1.2 (2725)
Which of the following statements is correct?The blood-pressure which is measured during flight medical checks is the pressure
a) in the artery of the upper arm (representing the pressure at heart level)
b) in all the blood-vessels of the body (representing the pressure in the whole body)
c) in the mussles of the upper arm
d) in the veins of the upper arm

40.2.1.2 (2726)
Blood-pressure depends on: 1. the cardiac output 2. the resistance of the capillaries (peripheral resistance)
a) 1 and 2 are correct
b) 1 is correct 2 is false
c) 1 is false 2 is correct
d) 1 and 2 are both false

40.2.1.2 (2727)
The blood-pressure depends on: 1. the work of the heart 2. the peripheral resistance 3. the elasticity of the arterial walls 4. the bloode volume and viscosity
a) 1,2,3 and 4 are correct
b) 1,2 and 3 are correct, 4 is false
c) 1,3 and 4 are correct, 2 is false
d) 2,3 and 4 are correct, 1 is false

40.2.1.2 (2728)
Changes in blood-pressure are measured by:
a) pressoreceptors
b) arteriols
c) adrenal glands
d) pacemakers

40.2.1.2 (2729)
The pressoreceptors are located in
a) the carotid and aortic arterial vessels
b) the intestines
c) the heart
d) the lungs

40.2.1.2 (2730)
When the pressoreceptors signal a lowering of the blood-pressure there are adaptation mechanisms which result in:1. an increase of respiratory activity2. the arteriols to constrict3. an increase of cardiac output4. the heart rate to rise
a) 2,3 and 4 are correct, 1 is false
b) 1,3 and 4 are correct, 2 is false

c) 1,2 and 4 are correct, 3 is false
d) 1,2 and 3 are correct, 4 is false

40.2.1.2 (2731)
The physiological effects of accelerations to the human body depend on:1. the duration of the G-forces 2. the onset rate of the G-forces3. the magnitude of the G-forces 4. the direction of the G-forces.
a) 1,2,3 and 4 are correct
b) 1,2,3 are correct, 4 is false
c) 2,3 and 4 are correct, 1 is false
d) 1and 4 are correct, 3 is false

40.2.1.2 (2732)
Inertia in the direction head => feet will cause the blood-pressure in the brain to:
a) decrease
b) remain constant
c) increase
d) first increase, then decrease

40.2.1.2 (2733)
During sustained positive G-forces the order of symptoms you can expect is:
a) grey-out, tunnel vision, black-out and unconsciousness.
b) unconsciousness, black-out, tunnel vision and grey out.
c) black-out, grey-out, tunnel vision and unconsciousness.
d) grey-out, unconsciousness, black-out and tunnel vision

40.2.1.2 (2734)
Which of the following measures can reduce the chance of a black-out during positive G-manoeuvres?
a) A tilt back seat.
b) Breathing oxygen.
c) Sit in upright position and keep relaxed.
d) Hyperventilation.

40.2.1.2 (2735)
The normal rate of breathing of an adult at rest is about:
a) 16 cycles per minute
b) 4 cycles per minute
c) 32 cycles per minute
d) 72 cycles per minute

40.2.1.2 (2736)
The volume of air beeing exchanged during a normal breathing cycle (tidal volume) is about:
a) 500 ml of air
b) 350 ml of air
c) 150 ml of air
d) 75 ml of air

40.2.1.2 (2737)
When exhaling, the expired air contains:
a) more carbon dioxide than the inspired air
b) more nitrogen than the inhaled air
c) less water vapour than the inhaled air
d) more oxygen than the inhaled air

40.2.1.2 (2738)
The primary factor to control the rate and depth of breathing is the:
a) pressure of carbon dioxide in the blood
b) partial pressure of nitrogen
c) partial pressure of oxygen in the blood
d) total air pressure in the blood

40.2.1.2 (2739)
The transfer of oxygen from the alveoli to the blood can be discribed by:
a) the law of diffusion
b) Boyle's Law
c) Dalton's Law
d) Henry's Law

40.2.1.2 (2740)
The transfer of carbon dioxide from the blood to the alveoli can be described by:
a) the law of diffusion
b) Boyles Law
c) Dalton's Law
d) Henry's Law

40.2.1.2 (2741)
The partial pressure of carbon dioxide in the alveoli is:
a) lower than in the blood
b) almost the same as in the atmospheric air
c) higher than the pressure of carbon dioxide in the blood
d) lower than the pressure of carbon dioxide in the atmospheric air.

40.2.1.2 (2742)
The symptoms of hyperventilation are caused by a:
a) surplus of CO_2 in the blood
b) surplus of O_2 in the blood
c) shortage of CO in the blood
d) shortage of CO_2 in the blood

40.2.1.2 (2743)
If somebody starts breathing faster and deeper without physiological need
a) the blood turns less more alkaline
b) the blood turns more acid
c) the acid-base balance of the blood will not change
d) the blood pressure in the brain will rise significantly

40.2.1.2 (2744)
During running your muscles are producing more CO_2, raising the CO_2 level in the blood. The consequence is:
a) hyperventilation (the rate and depth of breathing will increase)
b) cyanosis
c) hypoxia
d) vertigo

40.2.1.2 (2745)
During a final approach under bad weather conditions, you feel dizzy, get tingling sensations in your hands and a rapid heart rate. These symptoms could indicate:
a) hyperventilation
b) disorientation
c) hypoxia
d) carbon monoxide poisoning

40.2.1.2 (2746)
During final approach under bad weather conditions you are getting uneasy, feel dizzy and get tingling sensations in your hands. When hyperventilating you should
a) control your rate and depth of breathing
b) descend
c) apply the Valsalva method
d) use the oxygen mask

40.2.1.2 (2747)
A pilot can overcome hyperventilation by:
a) controlling the rate and depth of breathing, breathing into a bag or speaking with a loud voice
b) depending on instruments
c) increasing the rate and depth of breathing to eliminate harmful carbon dioxide
d) the use of drugs stabilizing blood pressure

40.2.1.2 (2748)
You can overcome hyperventilation by breathing into a plastic or paper bag. The intention is:
a) to raise the level of CO_2 in the blood as fast as possible
b) to prevent you from exhaling too much oxygen
c) to increase the amount of nitrogen in the lung
d) to reduce blood pressure

40.2.1.2 (2749)
Which symptom does not belong to the following list:
a) leans
b) bends
c) chokes
d) creeps

40.2.1.2 (2750)
The symptoms caused by gas bubbles under the skin following a decompression are called:
a) creeps
b) bends
c) chokes
d) leans

40.2.1.2 (2751)
Symptoms caused by gas bubbles in the lungs, following a decompression are called:
a) chokes
b) bends
c) creeps
d) leans

40.2.1.2 (2752)
Some hours after a rapid decompression at FL 300 you experience pain in the joints. Which of following answers is correct?
a) You should ask for medical advice (flight surgeon) since this is a symptom of decompression sickness.
b) This symptom indicates decompression sickness and will disappear when you take some exercise.
c) This phenomenon is treated by physiotherapy.
d) This phenomenon is treated by breathing 100% nitrogen.

40.2.1.2 (2753)
Tolerance to decompression sickness is decreased by:1. SCUBA-Diving2. Obesity3. Age4. Body height
a) 1, 2 and 3 are correct
b) 2 and 4 are correct
c) 1, 3 and 4 are correct
d) only 4 is correct

40.2.1.2 (2754)
Decompression symptoms are caused by:
a) dissolved gases from tissues and fluids of the body
b) low carbon dioxide pressure of inhaled air
c) low oxygen pressure of inhaled air
d) release of locked gases from joints

40.2.1.2 (2755)
In the event of rapid decompression the first action for the flight deck crew is:
a) don oxygen masks and ensure oxygen flow
b) descent to the higher of 10000 ft or MSA
c) transmit mayday call
d) carry out check for structural damage

40.2.1.2 (2756)
After a rapid decompression at an altitude of 30.000 FT the first action of the pilot shall be:
a) maintaining aircraft control and preventing hypoxia (use of oxygen mask)
b) informing ATC
c) informing the cabin crew
d) preventing panic of the passengers

40.2.1.2 (2757)
The following actions are appropriate when faced with symptoms of decompression sickness:1. climb to higher level2. descent to the higher of 10000 ft or MSA and land as soon as possible3. breathe 100 % oxygen4. get medical advice about recompression after landing
a) 2, 3 and 4 are correct
b) 1, 2 and 3 are correct
c) 1 and 4 are correct
d) 1 and 3 are correct

40.2.1.2 (2758)
Decompression sickness can be prevented by:1. avoiding cabin altitudes above 18 000 FT2. maintaining cabin pressure below 8 000FT when flying at high altitudes3. performing physical exercises before and during the flight4. breathing 100 % oxygen for 30 min prior and during the flight
a) 1, 2 and 4 are correct
b) 1, 2 and 3 are correct
c) 2 and 3 are correct, 4 is false
d) only 3 is correct

40.2.1.2 (2759)
What is the TUC at 20 000 FT?
a) about 30 minutes
b) 1 to 2 minutes
c) 1to 2 hours
d) 5 to 10 minutes

40.2.1.2 (2760)
Following a rapid decompression at 30.000 feet, the time of useful consciousness would be about:
a) 1 to 2 minutes
b) 3 to 5 minutes
c) 5 to 10 minutes
d) 10 to 12 minutes

40.2.1.2 (2761)
After a rapid decompression at 35 000 feet, the time of useful consciousness is about:
a) 30 to 60 seconds
b) 15 seconds or less
c) 5 minutes.
d) 10 minutes.

40.2.1.2 (2762)
After SCUBA diving (more than 30 feet of depth) you have to wait a period of time before flying again. This period is at least:
a) 24 hours
b) 6 hours
c) 12 hours
d) 48 hours

40.2.1.2 (2763)
Flying immediately after SCUBA diving involves the risk of getting:
a) decompression sickness without having a decompression
b) hyperventilation
c) hypoxia
d) stress

40.2.1.2 (2764)
If someone hyperventilates due to stress his blood will get:
a) more alkaline
b) less satured with oxygen
c) more satured with carbon dioxide
d) more acid

40.2.1.3 (2765)
The ozone-layer is situated in the
a) stratosphere
b) troposphere
c) thermosphere
d) ionosphere

40.2.1.3 (2766)
Which of the following statements are correct ?-1: Modern aircraft allow for 50 - 60% relative humidity in the cabin air under any conditions of flight, which is satisfactory for the body-2: Thirst is a belated symptom of dehydration-3: Dehydration may lead to clinical manifestations such as dizziness and fatigue-4: Drinking excessive quantities of water must be avoided since resistance to periods of low hydration will otherwise be lost
a) 2,3
b) 2,3,4
c) 1,2,4
d) 1,4

40.2.1.3 (2767)
With regard to the humidity of air in current in a pressurized cabin, we know that it :-1 : varies between 40 and 60%-2 : varies between 5 and 15%-3 : may cause dehydration effecting the performance of the crew-4 : has no special effects on crew members
a) 2,3
b) 1,3
c) 2,3,4
d) 1,4

40.2.2.0 (2768)
Which of the following statements is correct ?
a) 70% of information processed by man enters via the visual channel
b) Hearing is the sense which collects most information in man
c) 40% of information processed by man enters via the visual channel
d) The kinesthetic channel provides the most important information for flying

40.2.2.1 (2769)
Once we have constructed a mental model we tend
a) to give undue weight to information that confirms the model
b) to give undue weight to information that contradicts the model
c) to give equal weight to contradicting and confirming information
d) to alter that model unnecessarily frequently

40.2.2.1 (2770)
The rate and depth of breathing is primary regulated by the concentration of:
a) carbon dioxide in the blood
b) nitrogen in the air
c) water vapour in the alveoli
d) oxygen in the cells

40.2.2.1 (2771)
Rising the perceptual threshold of a sensory organ means:
a) a lesser sensitivity
b) a greater sensitivity
c) a greater selectivity
d) a lesser selectivity

40.2.2.1 (2772)
Subcutaneous pressure receptors are stimulated by:
a) the pressure created on the corresponding body parts when sitting, standing or lying down
b) a touch on the skin indicating the true vertical
c) environmental stressors
d) the condition of the body itself

40.2.2.1 (2773)
The kinesthetic sense does not orient an individual to his surroundings, but informs him of
a) the relative motion and relative position of his body parts
b) a touch on the skin
c) our surroundings
d) the condition in the body itself

40.2.2.1 (2774)
A stereotype and involuntary reaction of the organism on stimulation of receptors is called:
a) reflex
b) data processing
c) control system
d) change of stimulation level

40.2.2.2 (2775)
Vibrations can cause blurred vision. This is due to tuned resonance oscillations of the:
a) eyeballs
b) optic nerve
c) cristalline lens
d) photosensitive cells

40.2.2.2 (2776)
Depth perception when objects are close (< 1 m) is achieved through
a) seeing with two eyes (binocular vision)
b) good visibility only
c) visual memory only
d) the ""blind spot"" at the retina

40.2.2.2 (2777)
Adaptation is
a) the adjustment of the eyes to high or low levels of illumination
b) the change of the diameter of the pupil
c) the reflection of the light at the cornea
d) the adjustment of the crystalline lens to focus light on the retina

40.2.2.2 (2778)
The time required for complete adaptation is
a) for high levels of illumination 10 sec and for full dark adaptation 30 min
b) for high levels of illumination 10 minutes and for low levels of illumination 30 minutes
c) for day and night: 30 min
d) for night 10 sec and for day 30 min

40.2.2.2 (2779)
The requirement of good sunglasses is to
a) absorb enough visible light to eliminate glare without decreasing visual acuity, absorb UV and IR radiation and absorb all colors equally
b) fit to the pilots individual taste
c) eliminate distortion in aircraft windshields
d) increase the time for dark adaptation

40.2.2.2 (2780)
Why does a deficiency in vitamin A cause night-blindness?
a) Vitamin A is essential to the regeneration of visual purple
b) Accomodation is destroyed
c) Vitamin A deficiency interrupts the oxygen supply to the photosensitive cells
d) The transfer of light stimulus from the rods to a nerve impulse depends on vitamin A

40.2.2.2 (2781)
Scanning at night should be performed by:
a) slight eye movements to the side of the object
b) scanning with one eye open
c) concentrated fixation on an object (image must fall on the fovea centralis)
d) avoiding food containing Vitamin A

40.2.2.2 (2782)
Flickering light when reflected from spinning rotor blades
a) can cause spatial disorientation and/or nausea, when looked at for a longer period of time

b) can be neglected
c) can be avoided when the strobe-lights are switched on
d) should be avoided, because it may destroy the optical nerve

40.2.2.2 (2783)
What impression do you have when outside references are fading away (e.g. fog, darkness, snow and vapor)?
a) It is difficult to determine the size and speed of objects
b) Objects seem to be closer than in reality
c) Objects seem to be much bigger than in reality
d) There is no difference compared with flying on a clear and sunny day

40.2.2.2 (2784)
Hypoxia will effect night vision
a) at 5000 FT
b) less than day vision
c) and causes the autokinetic phenomena
d) and causes hyperventilation

40.2.2.2 (2785)
What does not impair the function of the photosensitive cells?
a) Fast speed
b) Oxygen deficiency
c) Acceleration
d) Toxic influence (alcohol, nicotine, medication)

40.2.2.2 (2786)
The fovea centralis is
a) the area of best day vision and no night vision at all
b) the area of the blind spot (optic disc)
c) where the optic nerves come together with the pupil
d) the area of best day vision and best night vision

40.2.2.2 (2787)
The retina of the eye
a) is the light-sensitive inner lining of the eye containing the photoreceptors essential for vision
b) filters the UV-light
c) is the muscle, changing the size of the crystalline lens
d) only regulates the light that falls into the eye

40.2.2.2 (2788)
Vitamin A and possibly vitamins B and C are chemical factors and essential to good night vision:1. Vitamin deficiencies may decrease night vision performance2. An excess intake of vitamin A will improve night vision performance significantly3. Pilots should be carefully concerned to take a balaced diet containing sufficient vitamin A4. Vitamin deficiencies may decrease visual acuity in photopic vision but not in scotopic vision
a) 1 and 3 are correct, 2 and 4 are false
b) 1, 2, 3 and 4 are correct
c) Only 4 is false
d) 1 and 3 are false, 2 and 4 are correct

40.2.2.2 (2789)
What should a pilot do to keep his night vision (scotopic vision)?
a) Not smoke before start and during flight and avoid flash-blindness
b) Avoid food containing high amounts of vitamin A
c) Wait at least 60 minutes to night-adapt before he takes off
d) Select meals with high contents of vitamin B and C

40.2.2.2 (2790)
Why should a pilot turn his attention to the instruments when approaching on a snowed up, foggy or cloudy winterday? Because
a) perception of distance and speed is difficult in an environment of low contrast
b) his attention will be distracted automatically under these conditions
c) the danger of a ""greying out"" will make it impossible to determine the height above the terrain
d) pressure differences can cause the altimeter to give wrong information

40.2.2.2 (2791)
Illuminated anti-collision lights in IMC
a) can cause disorientation
b) can cause colour-illusions
c) will improve the pilots depth perception
d) will effect the pilots binocular vision

40.2.2.2 (2792)
A shining light is fading out (i. e. when flying into fog, dust or haze). What kind of sensation could the pilot get?
a) The source of light moves away from him
b) The source of light stands still
c) The source of light is approaching him with increasing speed
d) The light source will make the pilot believe, that he is climbing

40.2.2.2 (2793)
To prevent the ""autokinetic phenomena"", the following can be done:
a) look out for additional references inside and/or outside the cockpit using peripheral vision also
b) fixate the source of light, first with one eye, then with the other
c) look sideways to the source of light for better fixation
d) turn down cabin light and shake head simultaneously

40.2.2.2 (2794)
Autokinesis is
a) the apparent movement of a static single light when stared at for a relatively long period of time in the dark
b) the phenomenon of spinning lights after the abuse of alcohol
c) the change in diameter of the pupil, when looking in the dark
d) the automatical adjustment of the crystalline lens to objects situated at different distances

40.2.2.2 (2795)
The time for dark adaptation is
a) 30 min
b) 10 sec
c) 1/10 sec
d) 10 min

40.2.2.2 (2796)
Sunglasses with variable filtration (phototrope glasses)
a) can have disadvantages when used in the cockpit due to their dependence on ultraviolet light which is screened by the cockpit glass
b) are generally forbidden for pilots
c) are ideal, as long as there are no polarisation effects
d) are advantageous for pilots

40.2.2.2 (2797)
What misjudgement may occur if an airplane is flying into fog, snow or haze?
a) Objects seem to be farther away than in reality
b) Objects will appear closer than they really are
c) Objects will appear bigger in size than in reality
d) Objects seem to move slower than in reality

40.2.2.2 (2798)
The peripheral vision is important for:
a) detecting moving objects
b) visual acuity
c) binocular vision
d) colour vision

40.2.2.2 (2799)
Although we have a field of vision of more than 180° it is important during flight to use the scan ning technique, because
a) only in the foveal area resolution is good enough to see an object clearly
b) it is tiring to look continually in the same direction
c) only in the peripheral area of the retina resolution is good enough to see an object clearly
d) the reduction in the field of vision with decreasing altitude is due to a lack of vitamin A

40.2.2.2 (2800)
When flying at night the first sense to be affected by a slight degree of hypoxia is the
a) vision
b) cochlea
c) sense of balance
d) proprioceptive sensitivity

40.2.2.2 (2801)
The part(s) of the eye responsible for night vision
a) are the rods
b) are the cones
c) are rods and cones
d) is the cornea

40.2.2.2 (2802)
The fovea
a) is an area in which cones predominate
b) is sensitive to very low intensities of light
c) is an area in which rods predominate
d) is the area responsible for night vision

40.2.2.2 (2803)
When the optical image forms in front of the retina, we are talking about
a) myopia
b) hypermetropia
c) presbyopia
d) astigmatism

40.2.2.2 (2804)
The time an eye needs to adapt fully to the dark is about:
a) 25 - 30 minutes
b) 5 minutes
c) 10 minutes
d) 10 seconds

40.2.2.2 (2805)
The photosensitive cells beeing responsible for night vision are called:
a) the rods
b) the fovea
c) the cones
d) the cones and the rods

40.2.2.2 (2806)
When flying through a thunderstorm with lightning you can protect yourself from flashblindness by:a) turning up the intensity of cockpit lightsb) looking inside the cockpitc) wearing sunglassesd) using face blinds or face curtains when installed
a) a), b), c) and d) are correct
b) a), b) and c) are correct, d) is false
c) a) and b) are correct, c) and d) are false
d) c) and d) are correct, a) and b) are false

40.2.2.2 (2807)
Which scanning technique should be used when flying at night?
a) Look to the side (15 - 20 deg) of the object.
b) Look directly at the object.
c) Blink your eyes.
d) Look with one eye.

40.2.2.2 (2808)
Rods (scotopic visual cells) allow for :
a) good night-vision after adaptation to darkness (30 min)
b) good, virtually instantaneous night-vision (scotopic vision)
c) precise vision of contours and colours
d) red vision, both during the day and at night

40.2.2.2 (2809)
To optimise one's night-vision performance, it is necessary :- 1 : to spend some time getting adapted to low levels of illumination- 2 : to increase the instrument panel lighting by reducing the cockpit lighting- 3 : not to focus on the point to be observed- 4 : to avoid blinding
a) 1,3,4
b) 1,2,4
c) 2,3,4
d) 2

40.2.2.2 (2810)
Visual perception of depth at close to medium distance is primarily due to
a) binocular vision
b) interactions between cones and rods
c) peripheral vision
d) the high sensitivity of the retina

40.2.2.2 (2811)
With regard to central vision, which of the following statements are correct ?-1: It is due to the functioning of rods-2: It enables details, colours and movement to be seen-3: Its very active both during the day and at night-4: It represents a zone where about 150.000 cones per mm are located to give high resolution capacity
a) 2,4
b) 1,2,4
c) 2,3,4
d) 1,3

40.2.2.2 (2812)
The ability of the human eye to read alphanumeric information (piercing vision):
a) is limited to the foveal area of the retina
b) is limited to daytime using the rod cells
c) is almost equally shared by the entire retina
d) is governed by peripheral vision over an area of approximately 20 degrees of angle

40.2.2.2 (2813)
Which of the following statement(s) is/are correct ?- 1: The retina has rods on its peripheral zone and cones on its central zone- 2: The retina has cones and the crystalline lens has rods- 3: The rods allow for night-vision- 4: The cones are located on the peripheral zone of the retina
a) 1,3
b) 1
c) 2,3
d) 4

40.2.2.2 (2814)
In order to get colour vision, it is necessary :-1 : for there to be considerable amount of light (ambient luminosity)-2 : at night to look at the point to be observed at an angle of 15°-3 : to allow the eye a period of time to get used to the light-4 : to avoid white light
a) 1
b) 1,2,3
c) 2,4
d) 3

40.2.2.2 (2815)
The retina allows for the acquisition of colours as a result of the:
a) cones located in its central part
b) rods located in its central part
c) crystalline lens
d) rods located in its peripheral zone

40.2.2.2 (2816)
The phenomenon of accommodation, which enables a clear image to be obtained, is accomplished by which of the following ?
a) The crystalline lens
b) The rods
c) The cones
d) The retina

40.2.2.2 (2817)
We know that, in the mechanism of sight, the retina allows for :
a) the acquisition of the visual signal and its coding into physiological data
b) the acquisition of the visual signal and the accommodation process
c) binocular vision
d) the analysis of visual signals

40.2.2.2 (2818)
We know that transverse accelerations (Gy)- 1 : are above all active in turns and pull-outs- 2 : are present during take-off and landing- 3 : are rare during routine flights- 4 : often lead to loss of consciousness
a) 3
b) 1,4
c) 2,3
d) 1,2,3

40.2.2.2 (2819)
Empty field myopia is caused by:
a) lack of distant focal points
b) atmospheric perspective
c) ozone at altitude
d) flying over mountainous terrain

40.2.2.2 (2820)
The amount of light which strikes the retina is controlled by:
a) the pupil
b) the ciliary body
c) the cornea
d) the lens

40.2.2.2 (2821)
When focussing on near objects:

a) the shape of lens gets more spherical
b) the shape of lens gets flatter
c) the cornea gets smaller
d) the pupil gets larger

40.2.2.2 (2822)
The ability of the lens to change its shape is called:
a) accomodation
b) binocular vision
c) depth perception
d) adaptation

40.2.2.2 (2823)
The mechanism of accomodation is caused by:
a) the functioning of the ciliary muscle aroud the lens
b) the elasticity of the optic nerves
c) the functioning of the muscles of the eye
d) the diameter of the pupil

40.2.2.2 (2824)
Presbyopia is:
a) far sightedness linked with age
b) short sightedness
c) myopia
d) high intraocular pressure

40.2.2.2 (2825)
Glaucoma1. can lead to total blindness2. can lead to undetected reduction of the visual field3. reduces visual acuity in its final stage
a) 1, 2 and 3 are correct
b) 1 and 3 are correct, 2 is false
c) 2 and 3 are correct, 1 is false
d) 1 is correct, 2 and 3 are false

40.2.2.2 (2826)
Glaucoma is:
a) high intra-ocular pressure
b) disturbed colour vision
c) disturbed adaptation
d) disturbed night vision

40.2.2.2 (2827)
Glaucoma is characterised by: 1. disturbed light adaptation 2. progressive narrowing of the visual field 3. insidious onset and concealed progression 4. an increase in intra-ocular pressure
a) 2, 3 and 4 are correct ,1 is false
b) 1, 2, 3 and 4 are correct
c) 1, 2 and 3 are correct, 4 is false
d) 1, 3 and 4 are correct, 2 is false

40.2.2.3 (2828)
Which is the audible range to human hearing?
a) Between 16 Hz and 20 KHz
b) Between 16 MHz and 20 000MHz
c) Between 16 KHz and 20 KHz
d) Between 16 Hz and 20 MHz

40.2.2.3 (2829)
Which of the following components belong to the middle ear?
a) Ossicles
b) Otoliths
c) Endolymph
d) Semicircular canals

40.2.2.3 (2830)
Which part of the inner ear is responsible for the perception of noise?
a) The cochlea
b) The semicircular canals
c) The sacculus and utriculus
d) The eustachian tube

40.2.2.3 (2831)
The group of tiny bones (the hammer, anvil and stirrup) are situated in
a) the middle ear
b) the inner ear
c) the outer ear
d) the maxillary sinus

40.2.2.3 (2832)
Any prolonged exposure to noise in excess of 90 db can end up in
a) noise induced hearing loss
b) conductive hearing loss
c) presbycusis (eefects of aging)
d) a ruptured ear drum

40.2.2.3 (2833)
All pilots are going to suffer some hearing deterioration as part of the process of growing old.The effects of aging
a) are to cut out the high tones first
b) are to cut out the low tones first
c) are to cut out all tones equally
d) will not affect a pilot's hearing if he is wearing ear-plugs all the time

40.2.2.3 (2834)
The human ear is capable of perceiving vibrations between the frequencies
a) 16 - 20,000 Hz
b) 0 - 16 Hz
c) 20,000 - 40,000 Hz
d) 30 - 15000 dB

40.2.2.3 (2835)
The intensity of a sound is measured in
a) decibels
b) hertz
c) cycles per second
d) curies

40.2.2.3 (2836)
The Eustachian tube connects:
a) the middle ear and the pharynx
b) the auditory duct and the inner ear
c) the semi circular canals
d) the middle ear and the inner ear

40.2.2.3 (2837)
Excessive exposure to noise damages:
a) the sensitive membrane in the cochlea
b) the semi circular canals
c) the ossicles
d) the eardrum

40.2.2.4 (2838)
Vibrations within the frequency band of 1/10 to 2 Hertz are a factor contributing to air-sickness, because they
a) upset the vestibular apparatus
b) interfere with those of the own blood thus causing circulation problems
c) interfere with the frequencies of the central nervous system
d) make the stomach and its contents vibrating at the same frequency

40.2.2.4 (2839)
What is understood by air-sickness?
a) A sensory conflict within the vestibular system accompanied by nausea, vomiting and fear
b) An illness caused by evaporation of gases in the blood
c) An illness caused by reduced air pressure
d) An illness caused by an infection of the middle ear

40.2.2.4 (2840)
When spinning an aircraft, the predominating type of acceleration will be
a) angular acceleration
b) radial acceleration
c) linear acceleration
d) vertical acceleration

40.2.2.4 (2841)
Tuned resonance of body parts, distressing the individual, can be caused by
a) vibrations from 1 to 100 Hz
b) vibrations from 16 Hz to 18 kHz
c) acceleration along the longitudonal body axis
d) angular velocity

40.2.2.4 (2842)
What could the crew do in order to avoid air-sickness with passengers?1. Avoid turbulences.2. Avoid flying through rough weather.3. Seat passenger close to the center of gravity.4. Give pertinent information.
a) 1, 2, 3 and 4 are correct
b) 1, 2 and 3 are correct, 4 is false
c) 3 and 4 are correct, 1 and 2 are false
d) Only 4 is correct

40.2.2.4 (2843)
The probability to suffer from air-sickness is higher, when
a) the passenger or student is afraid and/or demotivated to fly
b) the passenger has taken anti-motion sickness remedies prior flight
c) the student ist motivated and adapted to the specific stimuli of flying
d) the student has good outside visual reference

40.2.2.4 (2844)
Which force(s) affect(s) the otoliths in the utriculus and sacculus?
a) Gravity and linear acceleration
b) Gravity alone
c) Linear acceleration and angular acceleration
d) Angular acceleration

40.2.2.4 (2845)
The semicircular canals of the inner ear monitor
a) angular accelerations
b) movements with constant speeds
c) relative speed and linear accelerations
d) gravity

40.2.2.4 (2846)
Which part of the vestibular apparatus is affected by changes in gravity and linear acceleration?
a) The sacculus and utriculus
b) The semicircular canals
c) The cochlea
d) The eustachian tube

40.2.2.4 (2847)
Which part of the vestibular apparatus is responsible for the impression of angular acceleration?
a) The semicircular canals
b) The cochlea
c) The sacculus and utriculus
d) The eustachian tube

40.2.2.4 (2848)
The vestibular organ
a) reacts to linear/angular acceleration and gravity
b) gives the impression of hearing

c) reacts to pressure changes in the middle ear
d) reacts to vibrations of the cochlea

40.2.2.4 (2849)
The cupula in the semicircular canal will be bent, when a rotation begins. This is because
a) the fluid (endolymph) within the semicircular canal lags behind the accelerated canal walls
b) the cupula will stay in place and give the correct impression
c) the fluid (endolymph) will preceed the accelerated canal walls
d) the cupula will bend on constant angular speeds

40.2.2.4 (2850)
The semicircular canals monitor
a) angular accelerations
b) relative speed
c) horizontal and vertical accelerations
d) gravity

40.2.2.4 (2851)
Changes in ambient pressure and accelerations during flight are important physiological factors limiting the pilots performance if not taken into consideration. Linear accelerations along the long axis of the body
a) change blood presssure and blood volume distribution in the body
b) will have an effect on blood pressure and blood flow if the accelerative force acts across the body at right angles to the body axis
c) will not stimulate any of the vestibular organs
d) are of no interest when performing aerobatics

40.2.2.4 (2852)
The semicircular canals form part of the
a) inner ear
b) middle ear
c) ear drum
d) external ear

40.2.2.4 (2853)
Angular accelerations are picked up in the inner ear by
a) the semicircular canals
b) the tympanum
c) the saccule and the utricle
d) the cochlea

40.2.2.4 (2854)
The semicircular canals detect
a) angular accelerations
b) sound waves
c) linear accelerations
d) changes in arterial pressure

40.2.2.4 (2855)
Angular accelerations are perceived by:
a) the semi circular canals
b) the cochlea
c) the otholits
d) the receptors in the skin and the joints

40.2.2.4 (2856)
The otoliths in the inner ear are sensitive to:
a) linear acceleration and gravity
b) angular acceleration
c) angular speed
d) constant speed only

40.2.2.4 (2857)
Which of the following systems are involved in the appearance of motion sickness ?-1 : Hearing-2 : The vestibular system-3 : Vision-4 The proprioceptive senses ""Seat-of-the-Pants-Sense"")-5 : The gastrointestinal system
a) 2,3,4
b) 1,2,3
c) 2,3,4,5
d) 1,2,5

40.2.2.4 (2858)
Perceptual conflicts between the vestibular and visual systems are :1 - classic and resistant when flying in IMC2 - sensed via impressions of rotation3 - sensed via distorted impressions of the attitude of the aircraft4 - considerable during prolonged shallow turns under IMC
a) 1,2,3,4
b) 2,3,4
c) 1,3
d) 3,4

40.2.2.4 (2859)
The vestibular system is composed of-1: two ventricles-2 : a saccule-3 : an utricle-4 : three semicircular channels
a) 2,3,4
b) 1,4
c) 2,3
d) 1,3,4

40.2.2.4 (2860)
The inner ear is able to perceive: 1. angular acceleration 2. linear acceleration 3. noise
a) 1 and 2 and 3 are correct
b) 2 and 3 are correct, 1 is false
c) 1 and 2 are correct, 3 is false
d) 2 is correct, 1 and 3 are both false

40.2.2.5 (2861)
Flying a coordinated level turn will

a) make the body`s pressure receptors feel an increased pressure along the body`s vertical axis
b) first give the impression of climb , then the impression of descent
c) make the blood being pooled in the head
d) make the seat-of-the-pants sense feel a decreased pressure along the body`s vertical axis

40.2.2.5 (2862)
Being pressed into the seat can cause illusions and/or false reactions in a pilot lacking visual contact to the ground, because this sensation
a) corresponds with the sensation a pilot gets when starting a climb or performing a level turn
b) corresponds with the sensation a pilots gets, when flying straight and level or starting a descent
c) makes the pilot to pull up the nose to compensate for level flight
d) will not stimulate the ""seat-of-the-pants"" sense

40.2.2.5 (2863)
Which sensations does a pilot get, when he is rolling out of a coordinated level turn?
a) Descending and turning into the opposite direction
b) Flying straight and level
c) Climbing
d) Turning into the original direction

40.2.2.5 (2864)
How can a pilot prevent ""pilots-vertigo""?
a) Avoid steep turns and abrupt flight maneouvers and maintain an effective instrument cross check.
b) Practise an extremely fast scanning technique using off-center vision.
c) Use the autopilot and disregard monitoring the instruments.
d) Maintain orientation on outside visual references as long as possible and rely upon the senses of balance..

40.2.2.5 (2865)
How can a pilot overcome a vertigo, encountered during a real or simulated instrument flight?1. Establish and maintain an effective instrument cross-check.2. Always believe the instruments, never trust your sense of feeling.3. Ignore arising illusions.4. Move the head sidewards and back and forth to ""shake-off"" illusions.
a) 1, 2 and 3 are correct
b) 1and 2 are correct, 3 and 4 are false
c) Only 4 is correct
d) 1, 2, 3 and 4 are correct

40.2.2.5 (2866)
The proprioceptive senses (seat-of-the-pants sense) are important for motor coordination. They
a) are completely unreliable for orientation when flying in IMC
b) indicate the difference between gravity and G-forces
c) allow the pilot to determine the absolute vertical at flight condition
d) are important senses for flight training in IMC

40.2.2.5 (2867)
The so-called ""Seat-of-the-Pants"" sense is
a) not suitable for spatial orientation when outside visual references are lost
b) only to be used by experienced pilots with the permission to fly in IMC
c) useful for instrument and contact flight
d) the only sense a pilot can rely on, when flying in IMC

40.2.2.5 (2868)
Sensory input to the ""Seat-of-the-Pants"" sense is given by
a) subcutaneous pressure receptors and kinesthetic muscle activity sensors
b) blood rushing into legs
c) acceleration of the stomach (nausea)
d) pressure of the heart on the diaphragm

40.2.2.5 (2869)
Approaches at night without visual references on the ground and no landing aids (e.g. VASIS) can make the pilot believe of beeing
a) higher than actual altitude with the risk of landing short (""ducking under"")
b) higher than actual altitude with the risk of overshooting
c) lower than actual altitude with the risk of overshooting
d) lower than actual altitude with the risk of ducking under

40.2.2.5 (2870)
A pilot is used to land on wide runways only. When approaching a smaller and/or narrower runway, the pilot may feel he is at a
a) greater height than he actually is with the tendency to land short
b) lower than actual height with the tendency to overshoot
c) greater height and the impression of landing short
d) lower height and the impression of landing slow

40.2.2.5 (2871)
A pilot approaching a runway which is narrower than normal may feel he is at a greater height than he actually is. To compensate he may fly a
a) flatter than normal approach with the tendency to undershoot
b) compensatory glide path and land long
c) compensatory glide path and stall out
d) higher than normal approach with the tendency to overshoot

40.2.2.5 (2872)
The proprioceptive senses (""Seat of-the-Pants-Sense"")
a) give wrong information, when outside visual reference is lost
b) is a natural human instinct, always indicating the correct attitude
c) can be used, if trained, to avoid spatial disorientation in IMC
d) can neither be used for motor coordination in IMC and VMC

40.2.2.5 (2873)
The most probable reason for spatial disorientation is
a) a poor instrument cross-check and permanently transitioning back and forth between instruments and visual references
b) the lack of attention to the vertical speed indicator

c) to rely on instruments when flying in and out of clouds
d) to believe the attitude indicator

40.2.2.5 (2874)
What should a pilot do if he has no information about the dimensions of the runway and the condition of the terrain underneath the approach? He should
a) make an instrument approach and be aware of the illusory effects that can be induced
b) be aware that approaches over downsloping terrain will make him believe that he is higher than actual
c) make a visual approach and call the tower for assistance
d) be aware that approaches over water always make the pilot feel that he is lower than actual height

40.2.2.5 (2875)
Orientation in flight is accomplished by1. eyes2. utriculus and sacculus3. semicircular canals4. Seat-of-the-pants-Sense
a) 1, 2, 3 and 4 are correct
b) only 1 and 4 are correct
c) 2, 3 and 4 are correct , 1 is false
d) 2, 3 and 4 are false, only 1 is correct

40.2.2.5 (2876)
The ""Seat-of-the-Pants-Sense""
a) can give false inputs to body orientation when visual reference is lost
b) is a natural human instinct which will always indicate the correct body position in space
c) can be used, if trained, to avoid disorientation in space
d) can be used as a reference for determining attitude when operating in visual and instrument meteorological conditions

40.2.2.5 (2877)
The Seat-of-the-Pants Sense is including receptors in the
a) muscles, tendons and joints sensitive to the position and movement of body parts
b) semicircular canals
c) utriculus and sacculus
d) skin of the breech only

40.2.2.5 (2878)
A pilot is used to land on small and narrow runways only. Approaching a larger and wider runway can lead to :
a) an early or high ""round out""
b) a steeper than normal approach dropping low
c) a flatter than normal approach with the risk of ""ducking under""
d) the risk to land short of the overrun

40.2.2.5 (2879)
The impression of an apparent movement of light when stared at for a relatively long period of time in the dark is called
a) ""autokinesis""
b) ""white out""
c) ""oculogyral illusion""
d) ""oculografic illusion""

40.2.2.5 (2880)
Which problem may occur, when flying in an environment of low contrast (fog, snow, darkness, haze)?Under these conditions it is:
a) difficult to estimate the correct speed and size of approaching objects
b) impossible to detect objects
c) no problem to estimate the correct speed and size of approaching objects
d) improbable to get visual illusions

40.2.2.5 (2881)
A pilot approaching an upslope runway
a) may feel that he is higher than actual. This illusion may cause him to land short.
b) is performing a steeper than normal approach, landing long
c) establishes a higher than normal approach speed
d) establishes a slower than normal approach speed with the risk of stalling out

40.2.2.5 (2882)
The area in front of a threshold descends towards the threshold.Possible danger is:
a) approach is higher than normal and may result in a long landing
b) to drop far below the glide path
c) approach is lower than normal and may result in a short landing
d) to misjudge the length of the runway

40.2.2.5 (2883)
Dizziness and tumbling sensations, when making head movements in a tight turn, are symptoms of
a) ""Pilot`s vertigo""
b) ""Nystagmus""
c) ""Flicker-vertigo""
d) ""Oculogravic illusion""

40.2.2.5 (2884)
""Pilot's vertigo""
a) is the condition of dizziness and/or tumbling sensation caused by contradictory impulses to the central nervous system (CNS)
b) is the sensation to keep a rotation after completing a turn
c) is the sensation of climbing caused by a strong linear acceleration
d) announces the beginning of airsickness

40.2.2.5 (2885)
What can a pilot do to avoid ""Flicker vertigo"" when flying in the clouds?
a) Switch strobe-lights off
b) Dim the cockpit lights to avoid reflections
c) Engage the autopilot until breaking the clouds
d) Fly straight and level and avoid head movements

40.2.2.5 (2886)
What do you do, when you are affected by ""pilot`s vertigo""?1. Establish and

maintain an effective instrument cross-check.2. Believe the instruments.3. Ignore illusions.4. Minimize head movements.
a) 1, 2, 3 and 4 are correct
b) 1, 2 and 3 are correct, 4 is false
c) 1 and 2 are correct, 3 and 4 are false
d) Only 4 is false

40.2.2.5 (2887)
A pilot is prone to get vertigo, as visibility is impaired (dust, smoke, snow). What is the correct action to prevent vertigo?
a) Depend on the instruments
b) Reduce rate of breathing until all symptoms disappear, then breathe normal again
c) Concentrate on the vertical speedometer
d) Depend on information from the semicircular canals of the inner ear, because those are the only ones giving correct information

40.2.2.5 (2888)
The risk of getting a spatial disorientation is growing, when
a) there is contradictory information between the instruments and the vestibular organs
b) the pilot is buckled too tight to his seat and cannot sense the attitude changes of the aircraft by his Seat-of-the-Pants-Sense
c) the pilot is performing an effective instrument cross-check and is ignoring illusions
d) informations from the vestibular organ in the inner ear are ignored

40.2.2.5 (2889)
Vertigo is the result of
a) ""Coriolis-effect""
b) ""Oculogyral illusion""
c) ""Autokinetic-illusion""
d) ""Elevator illusion""

40.2.2.5 (2890)
Which flight-maneouvre will most likely induce vertigo? Turning the head while
a) banking
b) climbing
c) descending
d) flying straight and level

40.2.2.5 (2891)
With ""vertigo"" the instrument-panel seems to tumble . This is due to
a) the coriolis effect in the semicircular canals
b) tuned resonance caused by vibration
c) conflicting information between the semicircular canals and the tympanic membrane
d) oxygen deficiency

40.2.2.5 (2892)
""Pilot's vertigo"":
a) is a sensation of rotation during flight due to multiple irritation of several semicircular canals at the same time
b) the impression of flying straight and level while the aircraft is spinning
c) a sudden loss of visual perception during flight due to multiple irritation of the utriculus and sacculus at the same time
d) the impression of climbing when banking

40.2.2.5 (2893)
What is the name for the sensation of rotation occuring during flight and which is caused by multiple irritation of several semicircular canals at the same time?
a) ""Pilot's"" Vertigo.
b) Sudden incapacitation.
c) ""Seat-of-the-Pants"" illusions.
d) Graveyard spin.

40.2.2.5 (2894)
Without visual reference, what illusion could the pilot get, when he is stopping the rotation to recover from a spin? He will get the illusion of
a) spinning into the opposite direction
b) spinning into the same direction
c) straight and level flight
d) climbing and turning into the original direction of the spin

40.2.2.5 (2895)
Starting a coordinated level turn can make the pilot believe to
a) climb
b) descent
c) turn into the opposite direction
d) increase the rate of turn into the same direction

40.2.2.5 (2896)
When accelerating forward the otoliths in the utriculus/sacculus will
a) give the illusion of climbing (body tilting backwards, nose of the a/c going up)
b) give the illusion of banking
c) give the illusion of straight and level flight
d) give the illusion of descending (body tilting downwards, or forwards, nose of the airplane going down)

40.2.2.5 (2897)
A pilot, accelerating or decelerating in level flight may get:
a) the illusion of climbing or descending
b) the feeling of rotation
c) the illusion to turn
d) the impression of stationary objects moving to the right or left

40.2.2.5 (2898)
To prevent vertigo in flight we should
a) not move the head suddenly while we are turning
b) look towards the sides when we make a turn
c) breath deeply but control the respiratory frequency
d) keep breathing normally

40.2.2.5 (2899)
When stopping the rotation of a spin we have the sensation
a) that we are starting a spin into the opposite direction
b) of turning in the same direction
c) of the sharp dipping of the nose of the aircraft
d) of the immediate stabilization of the aircraft

40.2.2.5 (2900)
When accelerating in level flight we could experience the sensation of a
a) climb
b) descent
c) turn
d) spin

40.2.2.5 (2901)
During flight in IMC, the most reliable sense which should be used to overcome illusions is the:
a) visual sense, interpreting the attitude indicator
b) ""Seat-of-the-pants-Sense""
c) vestibular sense
d) visual sense by looking outside

40.2.2.5 (2902)
Spatial disorientation will be most likely to occur during flight:
a) if the brain receives conflicting informations and the pilot does not believe the instruments
b) when flying in and out of clouds and the pilot maintains good instrument cross check
c) when flying in light rain below the ceiling
d) when flying in bright sunlight above a cloud layer

40.2.2.5 (2903)
Autokinetic illusion is:
a) an illusion in which a stationary point of light, if stared at for several seconds in the dark, may - without a frame of reference - appear to move
b) the sensation during a radial acceleration of seeing a fixed reference point moving into the opposite direction of the acceleration
c) a conflict between the visual system and bodily sensations
d) poor interpretation of the surrounding world

40.2.2.5 (2904)
With regard to illusions due to perceptive conflicts, it may be said that they:
a) are mainly due to a sensory conflict concerning perception of the vertical and the horizontal between the vestibular and the visual system
b) originate from a conflict between instrument readings and external visual perceptions
c) are caused by the absence of internal visual cues exclusively
d) are caused by a conflictual disagreement concerning attitudinal perception between the various members of a crew

40.2.2.5 (2905)
Visual disturbances can be caused by:1. hyperventilation2. hypoxia3. hypertension4. fatigue
a) 1, 2 and 4 are correct
b) 1, 2, 3 and 4 are correct
c) 1, 2 and 3 are correct
d) 2, 3 and 4 are correct

40.2.2.5 (2906)
Desorientation is more likely to occur when the pilot is:1. flying in IMC2. frequently changing between inside and outside references3. flying from IMC into VMC4. having a cold
a) 1, 2 and 4 are correct
b) 1, 2 and 3 are correct
c) 2, 3 and 4 are correct
d) 1, 3 and 4 are correct

40.2.2.5 (2907)
Positive linear accelleration when flying in IMC may cause a false sensation of:
a) pitching up
b) pitching down
c) apparent sideward movement of objects in the field of vision
d) vertigo

40.2.2.5 (2908)
Linear accelleration when flying straight and level in IMC may give the illusion of:
a) climbing
b) descending
c) yawing
d) spinning

40.2.2.5 (2909)
Coriolis illusion, causing spatial disorientation is the result of:
a) simultaneous head movements during aircraft manoeuvres
b) undergoing positive G
c) gazing in the direction of a flashing light
d) normal deterioration of the semicircular canals with age

40.2.2.5 (2910)
When turning in IMC , head movements should be avoided as much as possible. This is a prevention against:
a) coriolis illusion
b) autokinesis
c) oculogyral illusion
d) pressure vertigo

40.2.2.5 (2911)
Which of the following illusions are brought about by conflicts between the visual system and the vestibular system ?-1: Illusions concerning the attitude of the aircraft-2: Autokinetic illusion (fixed point viewed as moving)-3: Illusions when estimating the size and distance of objects-4 : Illusions of rotation
a) 1,4
b) 2,3,4

c) 2
d) 3,4

40.2.2.5 (2912)
A pilot, trying to pick up a fallen object from the cockpit floor during a tight turn, experiences:
a) coriolis illusion
b) autokinetic illusion
c) barotrauma
d) pressure vertigo

40.2.2.5 (2913)
When a pilot is starring at an isolated stationary light for several seconds in the dark he might get the illusion that:
a) the light is moving
b) the size of the lightis varying
c) the intensity of the light is varying
d) the colour of the light is varying

40.2.2.5 (2914)
When you stare at a single light against the dark (f.e. an isolated star) you will find the light appears to move after some time. This phenomenon is called:
a) autokinetic phenomenon
b) black hole illusion
c) coriolis illusion
d) leans

40.2.2.5 (2915)
How is haze effecting your perception?
a) Objects seem to be further away than in reality.
b) Objects will give better contrast.
c) Haze makes the eyes to focus at infinity
d) Objects seem to be closer than in reality.

40.2.2.5 (2916)
The 'Black hole' phenomenon occurs during approaches at night and over water, jungle or desert. When the pilot is lacking of visual cues other than those of the aerodrome there is an illusion of
a) being too high and too far away, dropping low and landing short
b) being too close, landing long
c) climbing
d) being too low, flying a steeper approach than normal

40.2.2.5 (2917)
You fly VFR from your home base (runway width 27 m), to an international airport (runway width 45 m). On reaching your destination there is a risk of performing a:
a) high approach with overshoot
b) high approach with undershoot
c) low approach with overshoot
d) low approach with undershoot

40.2.2.5 (2918)
You fly VFR from your home base (runway width 45 m) to a small airfield (runway width 27 m). On reaching your destination there is a risk of performing a:
a) low approach with undershoot
b) high approach with overshoot
c) high approach with undershoot
d) low approach with overshoot

40.2.2.5 (2919)
1. In case of conflicting information you can always trust your Seat- of-the-Pants-Sense.2. In case of conflicting information between the sensory organs and the instruments you must believe the instruments.
a) 1 is false, 2 is correct
b) 1 and 2 are correct
c) 1 is correct, 2 is false
d) 1 and 2 are false

40.2.2.5 (2920)
How can spatial disorientation in IMC be avoided? By
a) maintaining a good instrument cross check.
b) believing your body senses only.
c) moving the head into the direction of the resultant vertical.
d) looking outside whenever possible ignoring the attitude indicator.

40.2.2.5 (2921)
Which procedure is recommended to prevent or overcome spatial disorientation?
a) Rely entirely on the indications of the flight instruments.
b) Tilt your head to the side to get better informations from the semicircular canals.
c) Rely on the Seat-of-the-Pants-Sense.
d) Get adapted to low levels of illumination before flying and use off-center vision all the time.

40.2.2.5 (2922)
How can a pilot prevent spatial disorientation in flight?
a) Establish and maintain a good instrument cross check.
b) Always try to catch outside visual cues.
c) Rely on good situational awareness believing your natural senses.
d) Rely on the kinaesthetic sense.

40.2.2.5 (2923)
If you are subjected to an illusion during night flying you should:
a) continue on instruments
b) dim the cockpit lighting
c) scan the surroundings
d) use your oxygen mask

40.2.2.5 (2924)
If you are disorientated during night flying you must:
a) relay on instruments
b) look outside
c) descend
d) check your rate of breathing - do not breathe too fast

40.2.3.0 (2925)
Which of the following statements are correct ?1 Hypothermia affects physical and mental abilities.2 Man has effective natural protection against intense cold.3 Shivering makes it possible to combat the cold to a certain extent, but uses up a lot of energy4 Disorders associated with hypothermia appear at a body temperature of less than 35°C
a) 1,3,4
b) 1,2,3
c) 2,4
d) 2,3,4

40.2.3.0 (2926)
Our body takes its energy from :1: minerals2: protein3: carbonhydrates4: vitamines
a) 2,3
b) 1,2,3,4
c) 1,4
d) 1,3

40.2.3.0 (2927)
Which of the following mechanisms regulate body temperature when expored to extreme high environmental temperatures?-1 : Shivering-2 : Vasoconstriction of peripheral blood vessels-3 : Sweating-4 : Vasodilation of peripheral blood vessels
a) 3,4
b) 1,3,4
c) 2,3
d) 1

40.2.3.0 (2928)
The following can be observed when the internal body temperature falls below 35°C :
a) shivering, will tend to cease, and be followed by the onset of apathy
b) the appearance of intense shivering
c) mental disorders, and even coma
d) profuse sweating

40.2.3.0 (2929)
We can observe the following in relation to a state of hypothermia :
a) reasoning problems as soon as body temperature falls below 37°C
b) a substantial increase in internal body temperature whereas peripheral temperature at the skin is stable
c) a rapid fall in ambient temperature
d) greater capacity for adaptation than in a hot atmosphere

40.2.3.0 (2930)
What is meant by metabolism ?
a) The transformation by which energy is made available for the uses of the organism
b) Information exchange
c) Transfer of chemical messages
d) Exchange of substances between the lung and the blood

40.2.3.0 (2931)
One of the waste products of the metabolic process in the cell is :
a) water
b) protein
c) sugar
d) fat

40.2.3.0 (2932)
The body loses water via:1. the skin and the lungs2. the kidneys
a) 1 and 2 are correct
b) 1 is correct and 2 is not correct
c) 1 is not correct and 2 is correct
d) both are false

40.2.3.2 (2933)
It is inadvisable to fly when suffering from a cold. The reason for this is:
a) pain and damage to the eardrum can result, particularly during fast descents
b) gentle descents at high altitude can result in damage to the ear drum
c) swollen tissue in the inner ear will prevent the air from ventilating through the tympanic membrane
d) swollen tissue in the Eustachian tube will cause permanent hearing loss

40.2.3.2 (2934)
It is inadvisable to fly when suffering from a cold. The reason for this is:
a) the tissue around the nasal end of the Eustachian tube is likely to be swollen thus causing difficulty in equalising the pressure within the middle ear and the nasal/throat area. Pain and damage to the eardrum can result, particularly during fast descents
b) although the change in air pressure during a climb at lower altitudes is very small, it increases rapidly at high altitudes. If the tissue in the Eustachian tube of the ear is swollen, gentle descents at high alltitude would result in damage to the ear drum
c) swollen tissue in the inner ear will increase the rate of metabolic production resulting in hyperventilation
d) because it will seriously affect peripheral vision

40.2.3.2 (2935)
Exchange of gasses between the body and the environment takes place at the:
a) lungs
b) heart
c) muscles
d) central nervous system

40.2.3.2 (2936)
The following occurs in man if the internal body temperature increases to 38°C :
a) impairment of physical and mental performance
b) apathy
c) considerable dehydration
d) nothing signifiant happens at this temperature. The first clinical signs only start to appear at 39°C

40.2.3.2 (2937)
Having a serious cold it is better not to fly, due to the extra risk of:1. flatulence2. pain in the ear during descent3. pressure vertigo4. pain in the nasal sinuses
a) 2,3 and 4 are correct
b) 1 and 2 are correct
c) 1,3 and 4 are correct
d) 1,2 and 4 are correct

40.2.3.2 (2938)
Having a serious cold, you are going to fly. What can you expect:
a) pain in the sinuses
b) bends
c) chokes
d) hypoxia

40.2.3.3 (2939)
Which of the following factors may have an influence on medical disqualification?
a) High and low blood pressure as well as a poor condition of the circulatory system.
b) High blood pressure only.
c) Blood pressure problems cannot occur in aircrew because they always can be treated by in-flight medication.
d) Low blood pressure only.

40.2.3.3 (2940)
When assessing an individuals risk in developing coronary artery disease, the following factors may contribute:1.obesity2.distress3.smoking4.family history
a) 1, 2, 3 and 4 are correct
b) 2 and 3 are correct, 1 and 4 are false
c) Only 3 is correct, 1, 2 and 4 are false
d) 1, 2 and 3 are correct, 4 is false

40.2.3.3 (2941)
Noise induced hearing loss is influenced by
a) the duration and intensity of a noise
b) the duration of a noise but not its intensity
c) the suddenness of onset of a noise
d) the intensity of the noise but not its duration

40.2.3.3 (2942)
To reduce the risk of coronary artery disease, exercise should be
a) double the resting heart rate for at least 20 minutes, three times a week
b) avoided since raising the heart rate shortens the life of the heart
c) double the resting heart rate for at least an hour, five times a week
d) triple the resting heart rate for 20 minutes, once a week

40.2.3.3 (2943)
Which of the following is most true?
a) Regular exercise is beneficial to general health, but the most efficient way to lose weight is by reducing caloric consumption
b) Regular exercise is an impediment to losing weight since it increases the metabolic rate
c) Regular exercise is beneficial to general health, and is the only effective way to lose weight
d) Regular exercise and reduction in caloric consumption are both essential in order to lose weight

40.2.3.3 (2944)
Conductive hearing loss can be caused by: 1. damage to the ossicles in the middle ear caused by infection or trauma 2. a damage of the auditory nerve 3. an obstruction in the auditory duct 4. a ruptured tympanic membrane
a) 1,2,3 and 4 are correct
b) 2,3 and 4 are correct, 1 is false
c) 1,2 and 3 are correct, 4 is false
d) 1,3 and 4 are correct, 2 is false

40.2.3.3 (2945)
Noise induced hearing loss (NIHL) is caused by:
a) damage of the sensitive membrane in the cochlea due to overexposure to noise
b) a blocked Eustachian tube
c) pressure differences on both sides of the eardrum
d) reduced mobility of the ossicles

40.2.3.3 (2946)
Which of the following statements about hyperthermia is correct ?
a) Complete adaption to the heat in a hot country takes about a fortnight.
b) Vasodilation is the only regulant which is capable of reducing body temperature.
c) Evaporation is more effective when ambient humidity is high.
d) Performance is not impaired by an increase in body temperature to 40°C or more.

40.2.3.3 (2947)
Visual acuity during flight at high altitudes can be affected by: 1. anaemia 2. smoking in the cockpit 3. carbon monoxide poisoning 4. hypoxia
a) 1, 2, 3 and 4 are correct
b) 1,2 and 3 are correct
c) 2,3 and 4 are correct
d) 1,3 and 4 are correct

40.2.3.4 (2948)
Alcohol, even when taken in minor quantities
a) can make the brain cells to be more susceptible to hypoxia
b) will stimulate the brain, making the pilot resistant to hypoxia
c) will have no effect at all
d) may improve the mental functions, so that the symptoms of hypoxia are much better to be identified

40.2.3.4 (2949)
Concerning flying and blood alcohol content the following statement is correct:
a) no flying under the influence of alcohol
b) flying with up to 0.05 % blood alcohol
c) flying with up to 0.15 % blood alcohol
d) flying with up to 0.08 % blood alcohol is safe, since driving is safe up to this limit

40.2.3.4 (2950)
The metabolisation of alcohol
a) is a question of time
b) is quicker when used to it
c) can be accelerated even more by coffee
d) can be influenced by easy to get medication

40.2.3.4 (2951)
Concerning the effects of drugs and pilot´s performance
a) the primary and the side effects have to be considered
b) the side effects only have to be considered
c) medication has no influence on pilot´s performance
d) only the primary effect has to be considered, side effects are negligable

40.2.3.4 (2952)
Drugs against allergies (antihistamines), when taken by an aviator can cause the following undesirable effects:1. Drowsiness, dizziness2. Dry mouth3. Headaches4. Impaired depth perception5. Nausea
a) 1, 2, 3, 4 and 5 are correct
b) only 3, 4 and 5 are correct
c) 2, 3 and 4 are correct
d) only 1 is correct

40.2.3.4 (2953)
The consumption of medicines or other substances may have consequences on qualification to fly for the following reasons:1. The desease requiring a treatment may be cause for disqualification.2. Flight conditions may modify the reactions of the body to a treatment.3. Drugs may cause adverse side effects impairing flight safety.4. The effects of medicine do not necessarily immediately disappear when the treatment is stopped.
a) 1, 2, 3 and 4 are correct
b) 1, 2 and 3 are correct, 4 is false
c) 3 and 4 are false, 1 and 2 are correct.
d) Only 2 is false.

40.2.3.4 (2954)
Cigarette smoking has particular significance to the flyer, because there are long-term and short-term harmful effects. From cigarette smoking the pilot can get:
a) a mild carbon monoxide poisoning decreasing the pilot´s tolerance to hypoxia
b) a mild carbon dioxide poisoning increasing the pilot's tolerance to hypoxia
c) a mild carbon monoxide poisoning increasing the pilot´s tolerance to hypoxia
d) a suppressed desire to eat and drink

40.2.3.4 (2955)
A pilot who smokes will loose some of his capacity to transport oxygen combined with hemoglobin. Which percentage of his total oxygen transportation capacity would he give away when he smokes one pack of cigarettes a day?
a) 5 - 8%
b) 0.5 - 2%
c) 12 - 18%
d) 20 - 25%

40.2.3.4 (2956)
Flying at pressure altitude of 10 000 ft, a pilot, being a moderate to heavy smoker, has an oxygen content in the blood equal to an altitude
a) above 10 000 FT
b) of 10 000 FT
c) lower than 10 000 FT
d) of 15000 FT when breathing 100% oxygen

40.2.3.4 (2957)
Which of the following applies when alcohol has been consumed?
a) Even after the consumption of small amounts of alcohol, normal cautionary attitudes may be lost
b) Drinking coffee at the same time will increase the elimination rate of alcohol
c) Small amounts of alcohol increase visual performance
d) Acute effects of alcohol cease immediately when 100% oxygen is taken

40.2.3.4 (2958)
Alcohol, when taken simultaneously with drugs, may
a) intensify the effects of the drugs
b) compensate for side effects of drugs
c) show undesired effects only during night flights
d) increase the rate of alcohol elimination from the blood

40.2.3.4 (2959)
Alcohol metabolism (elimination rate)
a) is approx. 0.015% per hour and cannot be expedited
b) is approx. 0.3% per hour
c) depends on wether you get some sleep in between drinks
d) definitely depends on the amount and composition of food which has been eaten

40.2.3.4 (2960)
When drugs against sleep disorders and/or nervosity have been taken and the pilot intends to fly, attention has to be payed to
a) the effect they have on reaction time and perceptional awareness
b) the effect they have on hearing
c) the fact that there is no difference in the quality of sleep produced under the influence of those drugs compared to normal drug-free sleep
d) schedule only those pilots, who show no reactions to these medications

40.2.3.4 (2961)
The rate of absorption of alcohol depends on many factors. However, the rate of metabolism or digestion of alcohol in the body is relatively constant. It is about
a) 0,01 - 0,015 mg % per hour
b) 0,02 - 0,05 mg % per hour
c) 0,2 - 0,25 mg % per hour
d) 0,3 - 0,35 mg % per hour

40.2.3.4 (2962)
A slight lack of coordination which can make it difficult to carry out delicate and precise movements occurs when the level of alcohol in the blood is exceeding
a) 0.05 % blood alcohol

b) 0.1 % blood alcohol
c) 0.15 % blood alcohol
d) 0.2 % blood alcohol

40.2.3.4 (2963)
The carcinogen (a substance with the ability to produce modifications in cells which develop a cancer) in the bronchi of the lungs is
a) tar
b) nicotine
c) carbon monoxide
d) lead

40.2.3.4 (2964)
One of the substances present in the smoke of cigarettes can make it significantly more difficult for the red blood cells to transport oxygen and as a consequence contributes to hypoxia. Which substance are we referring to?
a) Carbon monoxide
b) Carbonic anhydride
c) Tar
d) Carbon dioxide

40.2.3.4 (2965)
The so-called Coriolis effect (a conflict in information processing in the brain) in spatial disorientation occurs:
a) on stimulating several semicircular canals simultaneously
b) on stimulating the saccule and the utricle of the inner ear
c) on stimulating the cochlea intensely
d) when no semicircular canal is stimulated

40.2.3.4 (2966)
The chemical substance responsible for addiction to tobacco is
a) nicotine
b) carbon monoxide
c) tar
d) the combination of nicotine, tar and carbon monoxide

40.2.3.4 (2967)
A large number of medical preparations can be bought without a doctor´s prescription. In relation to using these preparations, which of the following is correct:
a) A pilot using any of these preparations should get professional advice from a flight surgeon if he intends to fly and self-medicate at the same time
b) They have no side effects which would give problems to a pilot during flight
c) The side effects of these types of preparations are sufficiently negligible as to be ignored by pilots
d) They will cause a condition of over-arousal

40.2.3.4 (2968)
Carbon monoxide, a product of incomplete combustion, is toxic because
a) it competes with oxygen in its union with haemoglobin
b) it prevents the absorption of food from the digestive tract
c) it prevents the excretion of catabolites in the kidneys
d) it disturbs gaseous diffusion at the alveoli capillary membrane

40.2.3.4 (2969)
Carbon monoxide is always present in the exhaust gases of engines. If a pilot is exposed to carbon monoxide, which of the following responses is correct?
a) A short exposure to relatively high concentrations of carbon monoxide can seriously affect a pilot´s ability to operate an aircraft.
b) Carbon monoxide is easily recognised by odour and taste.
c) Carbon monoxide can only affect pilots if they are exposed to them for a long period of time.
d) When exposed to carbon monoxide for a long period of time, the body will adapt to it and no adverse physical effects are experienced

40.2.3.4 (2970)
Adverse effects of carbon monoxide increase as:
a) altitude increases
b) altitude decreases
c) air pressure increases
d) relative humidity decreases

40.2.3.4 (2971)
Which statement is correct regarding alcohol in the human body?
a) Judgement and decision making can be affected even by a small amount of alcohol.
b) A small amount of alcohol increases visual acuity.
c) An increase of altitude decreases the adverse effect of alcohol.
d) When drinking coffee, the human body metabolizes alcohol at a faster rate than normal.

40.2.3.4 (2972)
Which statement is correct? 1. Smokers have a greater chance of suffering from coronary heart disease 2. Smoking tobacco will raise the individuals pysiological altitude during flight3. Smokers have a greater chance of decreasing ung cancer
a) 1,2 and 3 are correct
b) 1 and 2 are correct, 3 is false
c) 1 and 3 are correct, 2 is false
d) 2 and 3 are correct, 1 is false

40.2.3.4 (2973)
Smoking cigarettes reduces the capability of the blood to carry oxygen. This is because:
a) hemoglobin has a greater affinity for carbon monoxide than it has for oxygen
b) carbon monoxide in the smoke of cigarettes assists diffusion of oxygen in the alveoli
c) carbon monoxide increases the partial pressure of oxygen in the alveoli
d) the smoke of one cigarette can cause an obstruction in the respiratory tract

40.2.3.4 (2974)
CO (carbon monoxide) present in the smoke of cigarettes can lead to: 1. reduction of time of usefull consciousness 2. hypoxia at a much lower altitude than normal
a) 1 and 2 are both correct
b) 1 is correct, 2 is false

c) 1 is false, 2 is correct
d) 1 and 2 are both false

40.2.3.4 (2975)
Carbon monoxide in the human body can lead to: 1. loss of muscular power2. headache 3. impaired judgement 4. pain in the joints 5. loss of consciousness
a) 1, 2 , 3 and 5 are correct
b) 1, 2 and 4 are correct
c) 2 and 3 are correct, 1 is false
d) 1, 2, 3, 4 are correct

40.2.3.6 (2976)
Incapacitation is most dangerous when it is :
a) insinuating
b) obvious
c) sudden
d) intense

40.3.1.0 (2977)
The human information processing system is highly efficient compared to computers because of its
a) flexibility
b) speed
c) working memory capacity
d) independancy from attention

40.3.1.0 (2978)
In an abnormal situation the pilot has an apparently correct explanation for the problem. The chance that he/she now ignores or devalues other relevant information, not fitting into his/her mental picture is:
a) increasing
b) the same, no matter if he/she has already made up his/her mind
c) not applicable with old and experienced pilots
d) decreasing

40.3.1.0 (2979)
Many pilots think up systems to deal with affairs so they don't have to think up every time what they have to do.
a) this has to be posetively appreciated for it increases consistency in action
b) this is dangerous for every situation is different
c) this has to be rejected for the company draws the rules and the procedures they have to comply with
d) this has to be advised against for it reduces flexibility at a moment a problem has to be solved by improvisation.

40.3.1.1 (2980)
Mental schemes correspond to:
a) memorised representations of the various procedures and situations which can be reactivated by the pilot at will
b) the memorisation of regulatory procedures associated with a particular situation
c) memorised procedures which develop and change rapidly during change-over to a new machine
d) daily planning of probable dangerous situations

40.3.1.1 (2981)
The acquisition of expertise comprises three stages (Anderson model):
a) cognitive, associative and autonomous
b) cognitive, associative and knowledge
c) associative, autonomous and expert
d) automatic, cognitive and knowledge

40.3.1.1 (2982)
A pilot can be described as being proficient, when he/she:
a) has automated a large part of the necessary flight deck routine operations in order to free his/her cognitive resources
b) is able to reduce his/her arousal to a low level during the entire flight
c) knows how to invest the maximum resources in the automation of tasks in real time
d) is capable of maintaining a high level of arousal during a great bulk of the flight

40.3.1.1 (2983)
The ability of detecting relevant information which is not presented in an actively monitored input channel is known as
a) attention
b) perception
c) sensation
d) appreciation

40.3.1.1 (2984)
According to Wicken's theory, the human brain has:
a) different reservoirs of resources depending on whether one is in the information-gathering, information-processing or action phase
b) unlimited information-processing resources
c) cognitive resources which are centered on action
d) processing capabilities which function at peak level when different tasks call for the same resources

40.3.1.1 (2985)
The available cognitive resources of the human brain:
a) are limited and make it impossible to perform two attentional tasks at the same time
b) are limited but make it possible to easily perform several tasks at the same time
c) are virtually unlimited
d) allow for twin-tasks operation without any loss of effectiveness

40.3.1.1 (2986)
Concentration is essential for pilots.
a) However, capacity of concentration is limited
b) It only takes a little willpower to increase one's capacity of concentration without limits
c) Vigilance is all that is required to be attentive
d) All intellectual processes, including very routined ones, make demands on resources and therefore on one's concentration

40.3.1.1 (2987)
The 'cocktail party effect' is
a) the ability to pick up relevant information unintentionally
b) the ability to drink too much at social gathering
c) the tendency to believe information that reinforces our mental model of the world
d) the tendency not to perceive relevant information

40.3.1.1 (2988)
Which of the following tasks are possible to do simultaneously without mutual interference?
a) Maintain manual straight and level flight and solve a problem.
b) Listen attentively and solve a problem.
c) Talk and rehearse a frequency in working memory.
d) Read and listen attentively.

40.3.1.1 (2989)
A selective attentional mechanism is required
a) because of the limited capacity of the central decision maker and working memory
b) because the capacity of the long term memory is limited
c) because of the limitations of the sense organs
d) because of limitations in our store of motor programmes

40.3.1.1 (2990)
If a pilot has to perform two tasks requiring the allocation of cognitive resources :
a) the sharing of resources causes performance on each task to be reduced
b) a person reaches his limits as from simultaneous tasks, and performance will then tail off
c) the only way of not seeing performance tail off is to switch to knowledge-based mode for the two tasks
d) the only way of not seeing performance tail off is to switch to rules-based mode for the two tasks

40.3.1.1 (2991)
Which of the following are the most favourable solutions to manage phases of reduced or low vigilance (hypovigilance)?1. Healthy living2. Use of amphetamines3. Reducing the intensity of the light4. Organising periods of rest during the flight
a) 1,4
b) 1,2
c) 1,3
d) 3,4

40.3.1.1 (2992)
What are main signs indicating the loss of vigilance ?1. Decrease in sensory perception2. Increase in selective attention3. Sensation of muscular heaviness4. Decrease in complacency
a) 1,3
b) 1,4
c) 2,3
d) 2,4

40.3.1.1 (2993)
What is ""divided attention""?
a) Alternative management of several matters of interest
b) Ease of concentrating on a particular objective
c) Difficulty of concentrating on a particular objective
d) The adverse effect of motivation which leads to one's attention being dispersed

40.3.1.1 (2994)
Which of the following statements concerning hypovigilance is correct ? Hypovigilance :
a) may occur at any moment of the flight
b) essentially occurs several minutes after the intense take-off phase
c) tends to occur at the end of the mission as a result of a relaxation in the operators' attention
d) only affects certain personality types

40.3.1.1 (2995)
What are the main factors which bring about reduced or low vigilance (hypovigilance) ?1. The monotony of the task2. Tiredness,the need for sleep3. A lack of stimulation4. Excessive stress
a) 1,2,3
b) 2,4
c) 1,3
d) 3,4

40.3.1.1 (2996)
With regard to the level of automation of behaviours in the attention mechanism, we know that :
a) the more behaviour is automated, the less it requires conscious attention and thus the more it frees mental resources
b) the more behaviour is automated, the more it requires attention and the more it frees resources
c) the more behaviour is automated, the more it requires attention and the less it frees resources
d) the less behaviour is automated, the less it requires attention and the more it frees resources

40.3.1.1 (2997)
What are the various factors which guide attention ?1. The level of automation of behaviour2. Response time3. The salience of the information4. Expectations
a) 1,3,4
b) 1,4
c) 1,2
d) 2,3,4

40.3.1.1 (2998)
Check the following statements:1. The first information received determines how subsequent information will be evaluated.2. If one has made up one's mind, contradictory information may not get the attention it really needs.3. With increasing stress, channelizing attention is limiting the flow of information to the central decision maker (CNS).

<u>a) 1, 2 and 3 are correct</u>
b) 1and 3 are correct
c) 1 and 2 are correct
d) 2 and 3 are correct

40.3.1.2 (2999)
Conscious perception
<u>a) is a mental process involving experience and expectations</u>
b) relies upon the development of intuition
c) involves the transfer of information from the receptor to the brain only
d) relates to the correct recognition of colours

40.3.1.2 (3000)
The first stage in the information process is
<u>a) sensory stimulation</u>
b) perception
c) selective attention
d) the recognition of information

40.3.1.2 (3001)
Our mental model of the world is based
<u>a) on both our past experiences and the sensory information we receive</u>
b) entirely on the sensory information we receive
c) entirely on past experiences
d) on both our past experiences and our motor programmes

40.3.1.2 (3002)
What is the main adverse effect of expectations in the perception mechanism ?
<u>a) Expectations often guide the focus of attention towards a particular aspect, while possible alternates are neglected</u>
b) They always lead to routine errors
c) The unconscious mechanism of attention leads to focus on all relevant information
d) The attention area is enlarged, thus it will lead to an uncertainty in regard to necessary decisions

40.3.1.2 (3003)
Which of the following provides the basis of all perceptions?
<u>a) The intensity of the stimuli.</u>
b) The aural or visual significance attributed in short term memory.
c) The aural or visual significance attributed in long term memory.
d) The seperation of figure and background.

40.3.1.2 (3004)
The ""gestalt laws ""formulates :
<u>a) basic principles governing how objects are mentally organized and perceived</u>
b) basic principles governing the relationship between stress and performance
c) basic principles governing the effects of habit and experience
d) basic principles regarding to the relationship between motivation and performance

40.3.1.2 (3005)
Illusions of interpretation (cognitive illusions) are :
<u>a) associated with the task of mental construction of the environment</u>
b) due mainly to a conflict between the various sensory systems
c) due mainly to a poor interpretation of instrumental data
d) solely induced in the absence of external reference points

40.3.1.2 (3006)
In the absence of external reference points, the sensation that the vehicle in which you sitting is moving when it is in fact the vehicle directly alongside which is moving is called :
<u>a) illusion of relative movement</u>
b) autokinetic illusion
c) cognitive illusion
d) somato-gravic illusion

40.3.1.3 (3007)
The maximum number of unrelated items that can be stored in working memory is:
<u>a) about 7 items</u>
b) very limited - only 3 items
c) about 30 items
d) unlimited

40.3.1.3 (3008)
The capacity of the short-term memory is
<u>a) about 7 items</u>
b) very limited - only one item
c) about 30 items
d) unlimited

40.3.1.3 (3009)
Information stays in the short-term memory
<u>a) about 20 seconds</u>
b) less than 1 second
c) from 5 to 10 minutes
d) around 24 hours

40.3.1.3 (3010)
Working memory :
<u>a) is sensitive to interruptions which may erase all or some of its content</u>
b) is unlimited in size
c) is unlimited in duration
d) varies considerably in size between an expert pilot and a novice pilot

40.3.1.3 (3011)
Long-term memory is an essential component of the pilot's knowledge and expertise.
<u>a) It is desirable to pre-activate knowledge stored in long-term memory to have it available when required</u>
b) The capacity of long-term memory is limited

c) Long-term memory stores knowledge on a temporary basis
d) The recovery of information from long-term memory is immediate and easy

40.3.1.3 (3012)
Motor programmes are:
a) stored routines that enable patterns of behaviour to be executed without continuous conscious control
b) rules that enable us to deal with novel situations
c) rules that enable us to deal with preconceived situations
d) stored routines that enable patterns of behaviour to be executed only under continuous conscious control

40.3.1.3 (3013)
Working memory enables us, for example,
a) to remember a clearance long enough to write it down
b) to store a large amount of visual information for about 0.5 seconds
c) to ignore messages for other aircraft
d) to remember our own name

40.3.1.3 (3014)
In the short-term-memory, information is stored for approximately
a) 20 seconds
b) 5 minutes
c) 1 hour
d) a couple of days

40.3.1.3 (3015)
The main limit(s) of long-term memory is (are):
a) Data retrieval as a result from a loss of access to the stored information
b) the quantity of data which may be stored
c) the instantaneous inputting in memory of all information collected during the day, which comes to saturate it
d) the data storage time

40.3.1.3 (3016)
What are the main limits of short-term memory ?It is :-1 : very sensitive to interruptions and interference-2 : difficult to access-3 : limited in size-4 : subject to a biochemical burn-in of information
a) 1,3 ,4
b) 1,2 ,3
c) 2 ,3
d) 2,4

40.3.1.3 (3017)
Which of the following characteristics apply to short-term memory ?- 1 : It is limited in time and size- 2 : It is unlimited in time and limited in size- 3 : It is stable and insensitive to disturbances- 4 : It is limited in time and unlimited in size
a) 1
b) 1,3
c) 3,4
d) 2,3

40.3.1.3 (3018)
With regard to short-term memory, we can say that :
a) it is made up of everyday information for immediate use, and is limited in its capacity for storing and retaining data
b) it is made up of everyday information for immediate use, and is limited in terms of the time for which it retains data but not in its storage capacity
c) it is a stable form of working memory, and thus not very sensitive to any disturbance
d) it mainly contains procedural knowledge

40.3.1.3 (3019)
Which of the following statements about long-term memory are correct?-1: Information is stored there in the form of descriptive, rule-based and schematic knowledge.-2: The period of time for which information is retained is limited by the frequency with which this same information is used.-3: It processes information quickly and has an effective mode of access in real time.-4: Pre-activation of necessary knowledge will allow for a reduction in access time.
a) 1 and 4 are correct
b) 1 and 2 are correct
c) 2, 3 and 4 are correct
d) 2 and 4 are correct

40.3.1.3 (3020)
To facilitate and reduce the time taken to access information in long-term memory, it is helpful to:
a) mentally rehearse information before it is needed
b) learn and store data in a logical and structured way
c) structure irrelevant information as much as possible before committing it to memory
d) avoid to rehearse information which we know we will need soon

40.3.1.3 (3021)
Concerning the capacity of the human long-term memory
a) its storage capacity is unlimited
b) it is structurally limited in terms of storage capacity, but unlimted in terms of storage time
c) it is structurally limited in terms of storage time but not in terms of capacity
d) its mode of storing information is passive, making memory searches effective

40.3.1.4 (3022)
Young pilots or pilots with little experience of airplanes differ from experienced pilots in the following way :
a) unexperienced pilots refer to information more than experts when carrying out the same task
b) experienced pilots are less routine-minded than young pilots because they know that routine causes mistakes
c) task for task, an expert's workload is greater than a novice's one
d) flight planning performance decreases with age, and experience is unable to mask this deficiency

40.3.1.4 (3023)
In order to provide optimum human performance it is advisable to
a) establish strategies for planning, automating and managing resources (in real time)

b) plan a maximum of objectives and non-automated actions
c) avoid powerful behaviour expedient of automating tasks
d) plan future actions and decisions at least a couple of days in advance

40.3.1.4 (3024)
The planning and anticipation of future actions and situations makes it possible to:-1 : create a precise reference framework.-2 : avoid saturation of the cognitive system.-3 : automate planned actions.-4 : activate knowledge which is considered necessary for the period to come.The correct statement(s) is (are):
a) 1, 2 and 4 are correct
b) 1 and 2 are correct
c) 2 and 4 are correct
d) 3 and 4 are correct

40.3.1.4 (3025)
Pre-thought action plans may be said to:-1 : ease access to information which may be necessary.-2 : sensitize and prepare for a possible situation to come.-3 : be readily interchangeable and can therefore be reformulated at any time during the flight.-4 : define a framework and a probable strategy for the encountered situation.The combination of correct statements is:
a) 1, 2 and 4 are correct
b) 1, 2 and 3 are correct
c) 2 and 4 are correct
d) 2, 3 and 4 are correct

40.3.1.4 (3026)
The workload may be said to:-1 : be acceptable if it requires more than 90 % of the crew resources.-2 : be acceptable if it requires about 60 % of the crew resources.-3 : depend on the pilot's expertise.-4 : correspond to the amount of resources availableThe combination of correct statements is:
a) 2, 3 and 4 are correct
b) 1, 3 and 4 are correct
c) 1 and 3 are correct
d) 2 and 4 are correct

40.3.1.4 (3027)
Motivation is a quality wich is often considered vital in the pilot's work to maintain safety.
a) However, excessive motivation leads to stress wich adversly affects performance
b) Motivation reduces the intensity of sensory illusions
c) A high degree of motivation makes it possible to make up for insufficient knowledge in complete safety
d) A high degree of motivation lowers the level of vigilance

40.3.1.4 (3028)
The quality of learning :
a) is promoted by feedback on the value of one's own performance
b) depends on long-term memory capacity
c) is independent of the level of motivation
d) is independent of age

40.3.1.4 (3029)
Mental training, mental rehearsal of cognitive pretraining is called the inner, ideomotor simulation of actions.
a) It is most important for the acquisition of complex perceptual motor skills
b) It is most important for selfcontrol
c) It is most effective, if it is practiced on an abstract level if imagination
d) It is more effective than training by doing

40.3.1.4 (3030)
How can the process of learning be facilitated?
a) By reinforcing successful trials
b) By increasing the psychological pressure on the student
c) By punishing the learner for unsuccessful trials
d) By reinforcing errors

40.3.1.4 (3031)
Learning is called each lasting change of behaviour due to
a) practice and experience
b) innate mechanisms
c) maturation
d) drug influence

40.3.1.4 (3032)
Mental training is helpful to improve flying skills
a) at all levels of flying proficiency
b) only for student pilots
c) only for instructor pilots
d) only at a certain level of flying experience

40.3.1.4 (3033)
Which of the following are primary sources of motivation in day-to-day professional life ?1. Beeing in control of one's own situation2. Fear of punishment3. Success (achievement of goals)4. Social promotion, money
a) 1,2,3,4
b) 1,2,3
c) 3,4
d) 2,4

40.3.1.4 (3034)
Which of the following statements summarises the impact that motivation may have on attention ?
a) It increases the mobilisation of energy and thus facilitates the quality of alertness and attention
b) It only facilitates attention in extreme cases (risk of death)
c) Motivation has only a small effect on attention, but it facilitates alertness
d) It stimulates attention but may lead to phases of low arousal

40.3.1.4 (3035)
The effect of experience and habit on performance
a) can both be beneficial and negative
b) is always negative

c) is never negative
d) is always beneficial

40.3.1.4 (3036)
Murphy's law states :
a) If equipment is designed in such a way that it can be operated wrongly, then sooner or later, it will be
b) Response to a particular stressful influence varies from one person to another
c) Expectation has an influence on perception
d) Performance is dependent on motivation

40.3.1.4 (3037)
The needs of an individual lead to :
a) a change in the individuals motivation and consequently to an adaptation of the behaviour
b) preservation from dangers only if social needs are beeing satisfied
c) no change in his motivation and conrequently to the persistence of the individuals behaviour in regard to the desired outcome
d) prolonged suppression of all basic needs in favour of high self-actualization

40.3.1.4 (3038)
Whilst flying a coordinated turn, most of your activity is
a) skill based behaviour
b) coping behaviour
c) knowledge based behaviour
d) rule based behaviour

40.3.1.4 (3039)
If you approach an airfield VFR at a prescribed altitude, exactly following the approach procedure, and you encounter no inexpected or new problems you show:
a) skill based behaviour
b) knowledge based behaviour
c) rule based behaviour
d) rule and skill based behaviour

40.3.1.4 (3040)
The choice of the moment you select flaps depending on situation and conditions of the landing is:
a) skill based behaviour
b) knowledge based behaviour
c) pressure based behaviour
d) rule based behaviour

40.3.1.4 (3041)
The readiness for tracing information which could indicate the development of a critical situation
a) is necessary to maintain good situational awareness
b) is dangerous, because it distracts attention from flying the aircraft
c) makes no sense because the human information processing system is limited anyway
d) is responsible for the development of inadequate mental models of the real world

40.3.1.4 (3042)
1. Lively information is easier to take into consideration for creating a mental picture than boring information.2.The sequence in which information is offered is also important for the use the pilot makes of it.
a) 1 and 2 are both correct
b) 1 is correct, 2 is not correct
c) 1 is not correct, 2 is correct
d) 1 and 2 are both not correct

40.3.1.4 (3043)
The development of procedures makes pilots more effective and more reliable in their actions. This is called:
a) procedural consistency
b) mental model
c) knowledge-based behaviour
d) procedural confusion

40.3.2.0 (3044)
What means can be used to combat human error?-1 : Reducing error-prone mechanisms.-2 : Improving the way in which error is taken into account in training.-3 : Sanctions against the initiators of error.-4 : Improving recovery from errors and its consequences.The combination of correct statements is:
a) 1, 2 and 4
b) 3 and 4
c) 1 and 2
d) 2, 3 and 4

40.3.2.0 (3045)
It is desirable to standardize as many patterns of behaviour (operating procedures) as possible in commercial aviation mainly because
a) such behaviour reduces errors even under adverse circumstances
b) this lowers the ability requirement in pilot selection
c) this reduces the amount of training required
d) it makes the flight deck easier to design

40.3.2.0 (3046)
Human errors are frequent and may take several forms :
a) an error can be described as the mismatch between the pilots intention and the result of his/her actions
b) an error of intention is an error of routine
c) an violation is an error which is always involuntary
d) representational errors in which the pilot has properly identified the situation and is familiar with the procedure

40.3.2.0 (3047)
What is meant by the term 'complacency'?
a) Careless negligence or unjustified self-confidence
b) To question possible solutions
c) An agreement between captain and co-pilot due to Crew Resources Management
d) Physiological consequences on pilots because of fear of flying

40.3.2.0 (3048)
What would be the priority aim in the design of man-machine interfaces and in the creation of their application procedures for combatting problems associated with human error ?
a) To reduce the risks of the appearance or non-detection of errors entailing serious consequences
b) To eliminate the risk of latent errors occuring
c) To cater systematically for the consequences of errors in order to analyse their nature and modify ergonomic parameters
d) To put in place redundant alarm systems

40.3.2.1 (3049)
How can man cope with low error tolerant situations?
a) By constantly complying with cross-over verification procedures (cross monitoring)
b) By increasing error detection in all circumstances
c) By randomly applying a combination of optimum detection, warning and monitoring systems
d) By generally avoiding situations in which tolerance to error is low

40.3.2.1 (3050)
What are the various means which allow for better error detection?-1 : Improvement of the man-machine interface.-2 : Development of systems for checking the consistency of situations.-3 : Compliance with cross-over redundant procedures by the crew.-4 : Adaptation of visual alarms to all systems.The correct statement(s) is (are):
a) 1, 2 and 3
b) 1and 3
c) 2, 3 and 4
d) 3 and 4

40.3.2.1 (3051)
Why must flight safety considerations consider the human error mechanism? -1 : It is analysis of an incident or accident which will make it possible to identify what error has been committed and by whom. It is the process whereby the perpetrator is made responsible which may lead to elimination of the error.-2 : If we have a better understanding of the cognitive error mechanism, it will be possible to adapt procedures, aircraft interfaces, etc. -3 : It is error management procedure which enables us to continuously adjust our actions. The better we understand the underlying mechanism of an error, the better will be our means for detecting and adapting future errors.-4 : Since error is essentially human, once it has been identified by the use of procedures, a person will be able to anticipate and deal with it automatically in the future.The correct statement(s) is (are):
a) 2 and 3
b) 3 and 4
c) 2 and 4
d) 1 and 4

40.3.2.1 (3052)
Improvement of human reliability should entail:
a) an effort to understand the causes and find means of recovery for errors committed
b) in aviation, the elimination of errors on the part of front-line operators
c) the elimination of latent errors before they can effect performance
d) the analysis of modes of human failures

40.3.2.1 (3053)
An excessive need for safety
a) hampers severly the way of pilot decision making
b) is absolute necessary for a safe flight operation
c) is the most important attribute of a line pilot
d) guarantees the right decision making in critical situations

40.3.2.1 (3054)
Studies of human error rates during the performance of simple repetitive task have shown, that errors can normally be expected to occur about
a) 1 in 10 times
b) 1 in 50 times
c) 1 in 100 times
d) 1 in 250 times

40.3.2.1 (3055)
Which of the following human error rates can be described as both realistic and pretty good, after methodical training
a) 1 in 100 times
b) 1 in 1000 times
c) 1 in 10000 times
d) 1 in 100000 times

40.3.2.1 (3056)
Situations particularly vulnerable to ""reversion to an earlier behaviour pattern"" are :1. when concentration on a particular task is relaxed2. when situations are characterised by medium workload3. when situations are characterised by stress
a) 1. and 3.
b) 1. and 2.
c) 3.
d) 2. and 3.

40.3.2.2 (3057)
The most dangerous characteristic of the false mental model is, that it
a) is frequently extremely resistant to correction
b) will mainly occur under conditions of relaxation
c) will only occur under conditions of stress
d) can easily be changed

40.3.2.3 (3058)
Which of the following statements best fits the definition of an active error?Active error is:
a) produced by the operator and can be rapidly detected via the effects and consequences which it induces on the overall action
b) produced either by a front-line operator or by a remote operator and results in a hidden or latent consequence at a specific moment of the action
c) essentially results from the application of a bad rule or the poor application of a good rule

by airplane designers
d) rare in front-line actions and difficult to detect owing to the fact that it usually occurs in a complex system of uncontrolled and involuntary deviations

40.3.2.3 (3059)
What are the main consequences of latent errors? They:-1 : remain undetected in the system for a certain lenght of time.-2 : may only manifest themselves under certainl conditions.-3 : are quickly detectable by the front-line operator whose mental schemas on the instantaneous situation filter out formal errors.-4 : lull the pilots into security.The correct statement(s) is (are):
a) 1,2 and 4
b) 1 and 2
c) 1 and 3
d) 2, 3 and 4

40.3.2.3 (3060)
Which of the following statements fits best the concept of latent error?Latent errors:
a) have been present in the system for a certain lenght of time and are difficult to understand as a result of the time lag between the generation and the occurence of the error
b) are rarely made by front-line operators, and are consequently readily identified and detected by the monitoring, detection and warning links
c) are mainly associated with the behaviour of front-line operators and are only detected after advanced problem-solving
d) rapidly may be detected via their immediate consequences on the action in progress

40.3.2.3 (3061)
A system is all the more reliable if it offers good detectability. The latter is the result of:-1 : tolerance of the various systems to errors.-2 : the sum of the automatic monitoring, detection and warning facilities.-3 : the reliability of the Man-Man and Man-Machine links.-4 : the alerting capability of the Man-Machine interface.The combination of correct statements is:
a) 2 and 4
b) 1, 2 and 4
c) 1 and 3
d) 3 and 4

40.3.2.3 (3062)
According to Rasmussen's model, errors in rule-based control mode are of the following type(s) :
a) errors of technical knowledge
b) routine errors
c) handling errors
d) creative errors

40.3.2.3 (3063)
According to Rasmussen's model, errors are of the following type(s) in skill-based control mode:
a) routine errors
b) knowledge errors
c) handling errors
d) creative errors

40.3.2.3 (3064)
When can a system be said to be tolerant to error?When:
a) the consequences of an error will not seriously jeopardise safety
b) its safety system is too permeable to error
c) its safety system has taken account of all statistically probable errors
d) latent errors do not entail serious consequences for safety

40.3.2.3 (3065)
Once detected, an error will result in cognitive consequences which:
a) make it possible to modify behaviour with a view to adaptation
b) destabilize cognitive progress and maintain the error
c) are prompted by inductive factors
d) have virtually no interaction with behaviour

40.3.2.3 (3066)
Human behaviour is determined by:
a) biological characteristics, social environment and cultural influences
b) biological characteristics
c) the social environment
d) cultural influences

40.3.2.3 (3067)
The level of automation of behaviour-patterns facilitates the saving of resources and therefore of attention. On the other hand, it may result in :
a) routine errors (slips)
b) mistakes
c) decision-making errors
d) errors in selecting an appropriate plan of action

40.3.2.3 (3068)
In problem-solving, what determines the transition from rules-based activities to a knowledge-based activity ?
a) The unsuitability of the known rules for the problem posed
b) Attentional capture
c) Knowledge of rules which apply to the problem posed
d) The unsuitability of the automated actions

40.3.2.3 (3069)
Which of the following errors occur at rules-based level ?1.Omission2.The application of a poor rule3. Attentional capture4. The poor application of a good rule
a) 2,4
b) 1,2
c) 3,4
d) 1,3

40.3.2.3 (3070)
The descriptive aspect of errors according to Hollnagel's model describes various directly observable types of erroneous actions which are :1. Repetition and omission2. The forward leap and the backward leap3. Intrusion and anticipation4. Intrusion
a) 1,2,4
b) 1,3
c) 2,4
d) 1,2,3

40.3.2.3 (3071)
What happens in problem-solving when the application of a rule allows for the situation to be resolved ?
a) Actions return to an automatic mode
b) A switch is made to knowledge mode in order to refine the results
c) A switch is made to knowledge- based mode in order to continue monitoring of the problem
d) A second monitoring rule must be applied

40.3.2.4 (3072)
To avoid wrong decisions by the pilot, an aircraft system should at least be able to
a) report its malfunction
b) report the deviation
c) correct the deviation
d) tolerate the deviation

40.3.2.4 (3073)
Analysis of accidents involving the human factor in aviation shows that :
a) there is hardly ever a single cause responsible
b) only front-line operators are involved
c) only pilot training will make it possible to improve the situation
d) failure of the human factor is always connected with technical breakdowns

40.3.2.4 (3074)
What does the 'End Deterioration Effect'('Home-itis') mean?
a) The tendency to sudden, imperceptible errors shortly before the end of a flight
b) The result of a poor preflight planning
c) The potential risk of loosing orientation after flying in clouds
d) The breakdown of crew coordination due to interpersonal tensions between captain and co-pilot

40.3.2.4 (3075)
'Environmental capture' is a term used to describe which of the following statements?1.The tendency for a skill to be executed in an environment in which it is frequently exercised, even if it is inappropriate to do so2.The tendency for a skill acquired in one aircraft type to be executed in a new aircraft type, even if it is inappropriate to do so3. The tendency for people bo behave in different ways in different social situations4. The gaining of environmental skills
a) 1 and 2 are correct
b) 1, 2 and 3 are correct
c) 2 and 3 are correct
d) 4 is correct

40.3.2.4 (3076)
Under what circumstances will a pilot change from automated level to rule-based level ?
a) When detecting, that an automated behaviour will no longer lead to the intended outcome
b) Failure of all the known rules
c) The appearance of a situation or problem which is unknown and completely new
d) An automated cognitive check procedure

40.3.2.4 (3077)
Errors which occur during highly automated actions may result from :1. the capture of a poor action subprogram2. a mistake in the decision making process3. the application of a poor rule4. an action mode error
a) 1,4
b) 1,2
c) 3,4
d) 2,3,4

40.3.2.4 (3078)
What are the main characteristics of active errors ?They :1. are detectable only with difficulty by first-line operators2. have rapid and direct consequences on the action in progress3. are down to first-line operators4. have an impact on the overall action whose timing may be affected significantly
a) 2,3
b) 1,2
c) 3,4
d) 1,4

40.3.2.4 (3079)
The relationship which exists between crew error and flight safety :
a) is dependent on the social and technical system and also on the operational context created by the system
b) is a linear relationship which introduces crew training as the main factor
c) is independent of the operational context, with the latter being identical for any flight operation
d) has been evolving for 40 years and has now become independent of the social and technical system

40.3.2.4 (3080)
The effects of sleep deprivation on performance:1. increase with altitude2. decrease with altitude3. increase with higher workload4. decrease with higher workload
a) 1 and 3 are correct
b) 1,2 and 3 are correct
c) 1, 3 and 4 are correct
d) 2, 3 and 4 are correct

40.3.2.4 (3081)
What may be the origins of representation errors ?1. Perception errors2. The catering for all available information 3. Incorrect information from the observed world4. The receipt of a bad piece of information

a) 1,3,4
b) 1,2
c) 3,4
d) 2,3

40.3.3.0 (3082)
When a pilot is facing a problem during flight he should
a) take as much time as he needs and is available to make up his mind
b) always make up his mind quickly to give himself as much spare time as possible
c) avoid making up his mind until the very last minute
d) make up his mind before consulting other crew members

40.3.3.0 (3083)
The decision making in emergency situations requires firstly:
a) distribution of tasks and crew coordination
b) speed of reaction
c) informing ATC thoroughly about the situation
d) the whole crew to focus on the problem

40.3.3.0 (3084)
Which of the following abilities will not improve efficient decision making on the cockpit?
a) Ability to persuade others to follow the own point of view.
b) Communicational skills and social competence.
c) Ability to search for and examine all available information regarding a situation.
d) Ability to think ahead and specify alternative courses of action.

40.3.3.0 (3085)
The assessment of risk in a particular situation will be based on
a) subjective perception and evalutation of situational factors
b) external factors only
c) the emergency checklist only
d) situational factors only

40.3.3.0 (3086)
Once a pilot has developed a certain way of thinking about a problem he will probably
a) find it difficult to get out of that way of thinking and difficult to try a different interpretation of the data
b) find it difficult to stick to his/her interpretation of the data
c) find it easy to interpret the data in different ways
d) find it impossible to get out of that way of thinking, whatever happens

40.3.3.0 (3087)
To maintain good situational awareness you should:(1) believe only in your own interpretation of the data(2) gather as much datas as possible from every possible source before making inferences(3) question whether your hypothesis still fits the situation as events progress and try to make time to review the situation(4) consider ways of testing your situational hypothesis to see whether it is correct
a) 2, 3 and 4 are correct
b) all answers are correct
c) 1 and 4 are correct
d) 1 and 3 are correct

40.3.3.1 (3088)
Most accidents are mainly caused by lack of:
a) good judgement
b) physical skills
c) interpersonal relations
d) good maintenance of aircraft

40.3.3.1 (3089)
Judgement is based upon:
a) a process involving a pilot´s attitude to take and to evaluate risks by assessing the situation and making decisions based upon knowledge, skill and experience
b) a decision making process involving physical sensations and their transfer to manually operate the aircraft controls
c) the development of skills from constant practice of flight manoeuvres
d) the ability to interpret the flight instruments

40.3.3.1 (3090)
Which of the following statements is correct regarding decision making?
a) Deciding means choosing between alternatives.
b) Deciding means being able to come up with original solutions.
c) Deciding means imposing one's point of view.
d) Deciding means applying an automatic procedure.

40.3.3.1 (3091)
Which problem may be overlooked in the process of making a decision?
a) Owing to great haste, bypassing analysis of the current actual situation in order to apply the decision prepared beforehand
b) Preparing decisions often leads to strategies of minimum commitment
c) Preparing decisions promotes the appearance of inflexibilities
d) The captain's superior knowledge, justified by his/her status

40.3.3.1 (3092)
In terms of decision-making, the intention to become integrated into the team, to be recognised as the leader or to avoid conflicts may lead to :
a) the attempt to agree on decisions made by other crew members
b) an authoritarian approach thus demonstrating ones own ability to lead
c) the improvement of internal risk assessment capabilities
d) the suggestion of a sequential solution in which everyone can contribute what he/she knows

40.3.3.1 (3093)
What strategy should be put in place when faced with an anticipated period of time pressure ?
a) A strategy of preparing decisions
b) A non-sequential strategy
c) A Laissez-faire strategy
d) A strategy of no commitment

40.3.3.1 (3094)
Which biases relate to human decision making?1. Personal experience tends to alter the perception of the risk of an event occurring2. There is a natural tendency to want to confirm our decision even in the face of facts which contradict it3. The group to which an individual belongs tends to influence the particular decision4. There is natural tending to select only objective facts for decision-making purposes
a) 1,2,3
b) 1,2
c) 3,4
d) 1,2,4

40.3.3.1 (3095)
Habits and routine can influence decision-making in a way that:
a) a tendency to select the most familiar solution first and foremost, sometimes to the detriment of achieving the best possible result
b) one always wants to see previous experience confirmed by new decisions
c) professional pilots will never question established procedures
d) one always selects a choice in accordance with the company's usual practices

40.3.3.1 (3096)
Decision-making can be influenced by the following factors:1. people tend to conform to opinions expressed by a majority within the group they belong to2. people always tend to keep the future decisions in line with those their superiors have made in the past3. people more easily tend to select data which meet the expectations4. people hardly base decisions on their personal preferences but rather on rational information
a) 1,3
b) 2,3
c) 1,4
d) 2,4

40.3.3.1 (3097)
The DECIDE model is based on :
a) a prescriptive generic model, taking into account the method which seems most likely to come up with the solution
b) a prescriptive generic model which is subject to mathematical logic
c) a normative generic model based on mathematical logic
d) a statistical model based on observation of human decision-making

40.3.3.1 (3098)
Decision-making is a concept which represents :
a) a voluntary and conscious process of selection, from among possible solutions, for a given problem
b) an automated or automation-like act of applying defined procedures
c) an automatic process of selection from among the various solutions to a given problem
d) a spontaneous act of seeking the most effective solution in a given situation when faced with a defined problem

40.3.3.1 (3099)
Which of the following characteristics form part of decision-making on the flight deck ?
a) A good decision depends on analysis of the situation
b) A decision is only valid in a defined and delimited time
c) A good decision can always be reversed if its result does not come up to expectations
d) A group decision must always be established prior to action

40.3.3.1 (3100)
In decision-making, the selection of a solution depends :1. on objective and subjective criteria2. on the objective to be achieved3. on the risks associated with each solution4. above all on the personality of the decision-maker
a) 1,2,3,4
b) 1,2,4
c) 1,3
d) 4

40.3.3.1 (3101)
Decision-making results in:
a) a choice between different solutions for achieving a goal
b) a choice always based on the experience of the PIC
c) an objective choice concerning applicable solutions for a given end
d) a subjective choice concerning applicable solutions

40.3.3.1 (3102)
The confirmation bias of decision making is
a) a tendency to ignore that information which indicates that a decision is poor,
b) a tendency not to seek for information which confirms a judgement
c) a tendency not to look for information which would reassure oneself about a decision
d) a tendency to look for facts that confirm expectations before implementing one's decision

40.3.4.1 (3103)
The relevance of check procedures during flight becomes even more important when:
a) flying an unfamiliar type of aircraft and experiencing mental pressure
b) flying an aircraft which you have flown recently
c) conducting a longer flight than you would normally perform
d) flying an aircraft which you have flown many times before

40.3.4.1 (3104)
Which of the following responses is an example of ""habit reversion"" (negative habit transfer):
a) A pilot who has flown many hours in an aircraft in which the fuel lever points forward for the ON position, may unintentionally turn the fuel lever into the false position, when flying a different aircraft, where the fuel lever has to point aft to be in the ON position
b) Turning and aircraft to the left when intending to turn it to the right
c) Incorrect anticipation of an air traffic controller´s instructions
d) habitually missing an item on the checklist or missing the second item when two items are on the same line

40.3.4.1 (3105)
Although the anticipation of possible events is a good attitude for pilots to acquire, it can sometimes lead to hazardous situations. With this statement in mind, select

the response below which could lead to such a hazard:
a) mishearing the contents of a reply from an air traffic controller when a non-standard procedure was given but a standard procedure was anticipated
b) anticipating that the weather may deteriorate
c) anticipating that the flight will take longer time than planned
d) anticipating the sequence of items on a check list.

40.3.4.1 (3106)
The following course of action must be taken if gastrointestinal or cardiopulmonary complaints or pain arise before take-off :-1 : take the standard medicines and advise the doctor on returning from the flight-2 : assess your own ability to fly, if necessary with the help of a doctor-3 : if in doubt about fitness to fly - do not fly!-4 : reduce the cabin temperature, and drink before you are thirsty so as to avoid dehydration
a) 2,3
b) 1,3
c) 1,4
d) 1,2,4

40.3.4.1 (3107)
You are transporting a passenger who has to be at a certain destination for a meeting. The weather forcast at destination tends to be much worse than expected, so you consider to divert. The businessman offers you money if you manage to land there at any case.What is your appropriate way of action? You will
a) decide to divert if you think it is necessary.
b) continue and think about the nice things you can buy from the money
c) divert in any case to demonstrate who' s the man in charge aboard
d) see what you can do and ask the copilot to tolerate any decision

40.3.4.2 (3108)
Doing a general briefing in the preflight phase the captain should emphasize
a) particular requirements in the field of crew coordination due to specific circumstances
b) complete delegation of all duties
c) to depart on schedule
d) to avoid inadequate handling of flight controls

40.3.4.2 (3109)
Which of the following statements are correct with regard to the design of a check list?-1 : The longer a check list, the more it must be subdivided into logical parts.-2 : The trickiest points must be placed in the middle of the check list.-3 : Check lists must be designed in such a way that they can be lumped together with other tasks.-4 : Whenever possible, a panel scan sequence should be applied-5 : Critical points should have redundancies.The combination of correct statements is:
a) 1, 4 and 5 are correct
b) 1, 2 and 3 are correct
c) 1, 2 and 5 are correct
d) 1, 3 and 5 are correct

40.3.4.2 (3110)
The use of check lists must be carried out in such a way that:
a) their execution must not be done simultaneously with other actions
b) their execution may be done simultaneously with other actions
c) their execution is not lumped together with important tasks
d) it may be rejected since redundancy in the following check list will serve as verification

40.3.4.2 (3111)
The purpose of action plans which are implemented during briefings is to:
a) initiate procedures and reactions for situations that are most likely, risky or difficult during the flight
b) define general planning of the flight plan
c) allow everyone to prepare their own reactions in a difficult situation
d) activate a collective mental schema with respect to non-procedural actions to be carried out

40.3.4.2 (3112)
In order to overcome an overload of work during the flight, it is necessary to:-1 : know how to use one's own reserve of resources in order to ease the burden on the crew.-2 : divide up tasks among the crew.-3 : abandon automatic mode and instead process as much information as possible consciously.-4 : drop certain tasks and stick to high-level priorities.The correct statement(s) is (are):
a) 1, 2 and 4 are correct
b) 1 and 3 are correct
c) 1, 2 and 3 are correct
d) 3 and 4 are correct

40.3.4.2 (3113)
Which of the following statements concerning check list is correct?
a) The most important items should be placed at the beginning of a check list since attention is usually focused here
b) The most important items must be placed at the end of check list, allowing them to be kept near at hand so that they are quickly available for any supplementary check
c) The most important items must be placed in the middle of check list so that they come to be examined once attention is focused but before concentration starts to wane
d) All the items of a check list are equally important, their sequence is of no importance

40.3.4.2 (3114)
Of the following statements, which apply to coordinated cooperation?-1 : It allows for synergy in the actions between the captain and the pilot.-2 : It represents the simultaneous execution of a single action by the various members of the crew.-3 : Communication in this mode has the function of synchronizing actions and distributing responsibilities.-4 : Communication must be essentially focussed on temporal and cognitive synchronisation.The correct statement(s) is (are):
a) 1 and 3
b) 1,2 and 4
c) 2 and 3
d) 1 and 4

40.3.4.2 (3115)
What are the advantages of coordination?
a) Redundancy, synergy, clarification of responsibility.
b) Cooperation, cognition, redundancy.

c) Interaction, cognition, redundancy.
d) Redundancy, exploration, risky shift.

40.3.4.2 (3116)
Coaction is a mode of coordination which recommends:
<u>a) working parallel to achieve one common objective</u>
b) working parallel to achieve individual objectives
c) sustained cooperation on actions and the formulation of commitments concerning flight situations
d) the application of procedural knowledge in the conduct of specific actions

40.3.4.2 (3117)
The person with overall responsibility for the flight is the-1 Pilot in Command-2 Co-pilot-3 Navigator-4 Air traffic controllerThe correct statement(s) is (are):
<u>a) 1</u>
b) 1 and 2
c) 2 and 3
d) 4

40.3.4.2 (3118)
Action plans (SOP's) in a cockpit must :
<u>a) be shared by the members of the crew and updated at each modification in order to maintain maximum synergy</u>
b) be tailored to the individual pilot's needs in order to facilitate the normal operation of the aircraft
c) only be tailored to the type of aircraft, regardless of current MCC procedures
d) only follow the manufacturers proposals and not reflect individual operators cockpit philosophies

40.3.4.2 (3119)
The trend in airplane hull-loss rate over the last three decades seems to be related to :
<u>a) the crew</u>
b) the manufacturer
c) the number of engines
d) the year of manufacture

40.3.4.3 (3120)
Mark the two most important attributes for a positive leadership style:(1) dominant behaviour(2) examplary role-behaviour(3) mastery of communication skills(4) ""Laissez-faire"" behaviour
<u>a) 2 and 3</u>
b) 1 and 4
c) 1 and 3
d) 2 and 4

40.3.4.3 (3121)
During the preparational work in the cockpit the captain notices that his copilot on the one hand is rather unexperienced and insecure but on the other hand highly motivated. Which kind of leadership behaviour most likely is inappropriate?
<u>a) The captain lets the copilot fly and observes his behaviour without any comments</u>
b) The captain flies the first leg by himself and explains each action to the copilot in order to keep him informed about his decisions
c) The captain lets the copilot fly and gives him detailled instructions what to do
d) The captain lets the copilot fly and encourages him frankly to ask for any support that needed

40.3.4.3 (3122)
Which one of the following statements characterizes a democratic and cooperative leadership style?If conflicts evolve, the leader
<u>a) tries to clarify the reasons and causes of the conflict with all persons involved</u>
b) mainly tries to reconcile all persons involved in the conflict and tries to reestablish a nice and friendly atmosphere within the team
c) keeps a neutral position and does not participate in arguing
d) decides what to do and pushes his own opinion through

40.3.4.3 (3123)
Which of the following sentences concerning crew-performance is correct?
<u>a) The quality of crew-performance depends on the social-competence of individual team members</u>
b) To be a member of a team can not increase one's own motivation to succeed in coping with task demands
c) Mistakes can always be detected and corrected faster by the individual
d) The quality of crew-performance is not dependent on social-competence of individual team members

40.3.4.3 (3124)
Informal roles within a crew
<u>a) evolve as a result of the interactions that take place among crew members</u>
b) are explicitely set out by the crew
c) do not impair the captain's influence
d) characterize inefficient crews

40.3.4.3 (3125)
Which statement is correct? Crew decision making is generally most efficient, if all crew members concerned
<u>a) adapt their management style to meet the situational demands</u>
b) are always task oriented
c) are always relationship oriented
d) always ask the captain what to do

40.3.4.3 (3126)
Which behaviour does most likely promote a constructive solution of interpersonal conflicts?
<u>a) Active listening.</u>
b) Responding with counter-arguments.
c) Staying to the own point of view.
d) Giving up the own point of view.

40.3.4.3 (3127)
The team spirit of a cockpit-crew most likely depends on

a) both pilots respecting each other and striving for the same goals
b) both pilots wearing the same uniform
c) both pilots flying together very often for a long period
d) both pilots having the same political and ideological attitude

40.3.4.3 (3128)
During the cruising phase of a short-haul flight the captain starts to smoke a cigarette in the cockpit. The flying copilot asks him to stop smoking because he is a non-smoker. The captain tells him: 'This is your problem', and continues smoking. What should the copilot do?
a) He should not further discuss this issue but should come back to this conflict during the debriefing
b) He should learn to accept the captain smoking cigarettes in the cockpit
c) He should repeat his worries about smoking in the cockpit and should argue with the captain about this problem until the conflict is solved
d) He should report the chief pilot about this behaviour of the captain

40.3.4.3 (3129)
How would you call the leadership style of a captain who primarily is interested in a friendly atmosphere within his crew, who is always constructive and encouraging, who usually compromises in interpersonal conflicts, who trusts in the capabilities of his crew-members, and who leaves the crew freedom for own decisions, even if this makes the process more difficult?
a) Low task-orientation and high relationship-orientation
b) High task-orientation and low relationship-orientation
c) High task-orientation and high relationship-orientation
d) Low task-orientation and low relationship-orientation

40.3.4.3 (3130)
If the copilot continuosly feels unfairly treated by the captain in an unjustified way, then he should
a) duly point out the problem, reconcentrate on his duties and clear the matter in a more appropriate occasion
b) freeze the communication and thus avoid immediate confrontation
c) speak up and point at consequencies if unfair behaviour persists
d) internally retire and think positive

40.3.4.3 (3131)
The ""ideal professional pilot"" is, in his behaviour,
a) ""person"" and ""goal"" oriented
b) rather ""person"" than ""goal"" oriented
c) neither ""person"" nor ""goal"" oriented
d) rather ""goal"" than ""person"" oriented

40.3.4.3 (3132)
Pilots are more easily inclined to take greater risks when:
a) they are part of a group of pilots and they feel that they are beeing observed and admired (e.g. air shows)
b) making decisions independently of others
c) they are not constrained by time
d) making a flight over unfamiliar territory

40.3.4.3 (3133)
What are typical consequences of conflicts between crew members?-1 The quality of work performance decreases as a result of the impoverishment of communications-2 A decrease in the quality of communications-3 In the case of a crew made up of experts, conflicts only result in a deterioration in relations between the individuals-4 A decrease in the usage of available resources on the flight deckThe correct statement(s) is (are):
a) 1, 2 and 4 are correct
b) 2, 3 and 4 are correct
c) 1,3 and 4 are correct
d) 1,2 and 3 are correct

40.3.4.3 (3134)
What elements establish synergy within the crew ?
a) Synergy must be built up from the start of the mission (briefing) and be maintained until it comes to an end (debriefing)
b) Synergy establishes itself automatically within the crew, right through from briefing to debriefing
c) Synergy is independent of the natural individual characteristics of the group members (communication, mutual confidence, sharing of tasks, etc.)
d) It is only the captain's status which allows the establishment of synergy within the crew

40.3.4.3 (3135)
Which of the following statements best characterise a synergetic cockpit?1. Decisions are taken by the captain, but prepared by the crew2. There is little delegating of tasks3. Communications are few in number but precise and geared purely to the flight4. Fluid, consensual boundaries exist in regard to leadership-style, which fluctuate between authority and laissez-faire
a) 1,4
b) 1,3,4
c) 2,3
d) 2,4

40.3.4.3 (3136)
Which of the following statements best characterise a self-centered cockpit ?
a) Without taking note of what the other members are doing, each one does his own thing while at the same time assuming that everyone is aware of what is being done or what is going on
b) The egocentric personality of the captain often leads to a synergetic cockpit
c) The communication between crew members always increases when the captain takes charge of a situation
d) While decreasing communication, the independence of each member bolsters the crew's synergy

40.3.4.3 (3137)
What may become the main risk of a ""laissez-faire"" cockpit ?
a) Inversion of authority
b) Lack of communication
c) Appearance of agressiveness
d) Disengagement of the co-pilot

40.3.4.3 (3138)
What is characterized by a ""laissez-faire"" cockpit ?
a) A passive approach by the captain allows decisions, choices and actions by other crew members
b) Each member carries out actions and makes choices without explicity informing the other members about them
c) The captain's authority rules all the actions or decisions associated with the situation
d) The high level of independence granted to each member by the captain quickly leads to tension between the various crew members

40.3.4.3 (3139)
What are the most frequent and the least appropriate reactions on the part of a co-pilot when faced with a highly authoritarian captain ?1. Self-assertion2. A scapegoat feeling3. Delayed reactions to observed discrepancies4. Disengagement
a) 2,3,4
b) 1,2
c) 3,4
d) 1,3,4

40.3.4.3 (3140)
What are the most frequent results of an self-centred captain on the flight deck ?
a) In a two-pilot flight deck, the co-pilot is ignored and may react by disengaging, showing delayed responses or demonstrate the scapegoat effect
b) High group performance despite the strained relations
c) A major risk of authority inversion if the co-pilot is inassertive
d) Performance is very poor as self-centred behaviour leads to an increase of cooperation and efficiency

40.3.4.3 (3141)
An autocratic cockpit is described by :
a) The captain's excessive authority cosiderably reduces communications and consequently the synergy and cohesion of the crew
b) Despite the overly strong authority of the captain, everything functions correctly owing to his natural leadership
c) Each of the members chooses what job to do without telling the others and in the belief that everyone is aware of what he is doing
d) The atmosphere is relaxed thanks to a captain who leaves complete freedom to the various members of the crew

40.3.4.3 (3142)
What optimises crew co-operation ?1. Sharing and common task2. Confidence in each others capability3. Precise definition of functions associated with each crew members role
a) 1,2,3
b) 1
c) 1,2
d) 2,3

40.3.4.3 (3143)
What distinguishes status from role ?
a) While role defines- via behaviour- the functions that must be performed by individuals, status defines the enjoyment of a hierarchical position and its recognition by the group
b) While role defines the enjoyment of a hierarchical position and its recognition by the group, status defines - via behaviour- the functions that must be performed by individuals
c) Unlike status, role is fixed and is not modified either by the situation in flight or by the interactions of a new crew
d) Unlike status, role is fixed and is modified either by the situation in flight or by the interactions of a new crew

40.3.4.3 (3144)
What characterises the notion of role ?
a) The function and behaviour associated with the particular role
b) Only the functions associated with role
c) The characteristic behaviour associated with the description of the various roles of a particular status
d) The hierarchical position of the function and the associated behaviour

40.3.4.3 (3145)
What is synergy in a crew ?
a) The coordinated action of all members towards a common objective, in which collective performance is proving to be more than the sum of the individual performances
b) A behavioural expedient associated with the desynchronisation of the coordinated actions
c) The coordinated action of unrelated individual performances in achieving a non-standard task
d) The uncoordinated action of the crewmembers towards a common objective

40.3.4.3 (3146)
Safety is often improved by applying the principles of CRM, e.g.:
a) expression of one's doubts or different opinion for as long as this doubt can not be rejected on the base of evidence
b) unquestioned obedience to all the Captain's decisions
c) abstention from any suggestion which might be untimely
d) the avoidance of any conflict in order to preserve the crew's synergy

40.3.4.3 (3147)
An efficient flight deck (synergetic cockpit) will be observed when:
a) decisions are taken by the Captain with the help and participation of the other crew members
b) the plan of action is defined by the Captain because of his experience level
c) the Captain delegates the decision making process to other crew members
d) decisions do not need to be discussed because of a common synergy between the crew members

40.3.4.3 (3148)
An non-synergetic cockpit :
a) is characterised by withdrawn crewmembers and unclear communication
b) is characterised by a highly efficient crew, communicating appropriately with the outside
c) always results from an over-relaxed atmosphere
d) is not very dangerous as each person checks everything personally

40.3.4.3 (3149)
CRM (Crew Resource Management) training is:
a) intended to develop effectiveness of crew performance by improving attitudes towards flight safety and human relationship management
b) not intended to change the individual's attitude at all
c) intended solely to alter an individual's personality,
d) is mainly of relevance to pilots with personality disorders or inappropriate attitudes

40.3.4.4 (3150)
What does not apply to a constructive and helpful feedback?
a) Feedback should always state bluntly the personal failings of the receiver
b) It should be individually tailored to the receiver's background
c) It should be formulated subjectively and personally ('I' instead of 'one')
d) It should be actual and specify in regard to the concerned situation

40.3.4.4 (3151)
Which statement is correct?
a) Problems in the personal relation between crew members very likely hamper their communication process.
b) There is no relation between inadequate communication and incidents or accidents.
c) Inconsistent communication behaviour improves flight safety.
d) Problems in the personal relation between crew members hardly hamper their communication process.

40.3.4.4 (3152)
What is the sender's frequent reason to communicate implicitly ('between the lines')?
a) Afterwards he/she always can claim to have been misunderstood.
b) There is no need to make up one's mind before starting to communicate.
c) The receiver grasps quickly what the sender means.
d) He/she has not to adjust to the communication style of the communication partner.

40.3.4.4 (3153)
Metacommunication is defined as
a) communicating about the communication
b) balancing the own ideas and interests with those of the interlocutor
c) having an assessment conversation
d) active listening

40.3.4.4 (3154)
An individually given feedback improves communication. Which of the following rules should a feedback comply with?
a) The feedback should always relate to a specific situation.
b) The feedback should only be given if requested by the captain.
c) The receiver of the feedback should immediately justify his behaviour.
d) The feedback should not be referred to a concrete situation.

40.3.4.4 (3155)
Nonverbal communication
a) supports verbal communication
b) is of no meaning in the cockpit
c) is always used intentionally
d) should be avoided by all means in the cockpit

40.3.4.4 (3156)
How do you understand the statement 'one cannot not communicate'?
a) Beeing silent as well as inactive are nonverbal behaviour patterns which express a meaning.
b) Each situation requires communication.
c) You cannot influence your own communication.
d) The statement above is a missprint.

40.3.4.4 (3157)
With regard to the practice of English, which of the following statements is correct?
a) All pilots should master it because the aeronautical world needs one common language.
b) Be familiar with normal procedures in English since only this allows for effective management of any flight's communication.
c) It is necessary and sufficient to have a command of any of the official languages of the ICAO.
d) The composition of every crew should be geared to a command of the official aeronautical language of the destination country.

40.3.4.4 (3158)
Which of the following statements concerning communication is valid?
a) Professional communication means: using a restricted and specific language, tailored to minimize misunderstandings.
b) Professional communication means to exchange information as little as possible.
c) The syntax of communication is of little importance to its success. Only the words uttered are important.
d) Communication must take priority over any other flight activity under all circumstances

40.3.4.4 (3159)
Which combination of elements guarantee the understanding of a message without adding new information to it?
a) Feedback.
b) Coding.
c) Synchronization.
d) Encoding.

40.3.4.4 (3160)
The process of responding to a sender by confirming the reception of a message is called
a) feedback
b) redundancy
c) synchronization
d) transference

40.3.4.4 (3161)
Which elements of communication are prone to malfunctioning?
a) The sender and the receiver as well as coding and decoding

b) Coding and decoding
c) The sender
d) The receiver

40.3.4.4 (3162)
Discussing private matters in the cockpit
a) can improve team spirit
b) should be avoided by all means in the cockpit
c) is appropriate in any phase of flight
d) decreases the captains role of leadership

40.3.4.4 (3163)
With regard to communication in a cockpit, we can say that:
a) communication uses up resources, thus limiting the resources allocated to work in progress
b) communication is always sufficiently automated to enable an activity with a high workload element to be carried out at the same time
c) communication is only effective if messages are kept short and sufficiently precise to limit their number
d) all the characteristics of communication, namely output, duration, precision, clarity, etc. are stable and are not much affected by changes in workload

40.3.4.4 (3164)
The intended recipient of a message must:-1 : give priority and adapt to the sender's situation.-2 : acknowledge the receipt only in case of doubt.-3 : be able to reject or postpone a communication attempt if the pilot is too busy.-4 : stabilize or finish a challenging manoeuvre before starting a discussion.The combination of correct statements is:
a) 3 and 4 are correct
b) 1,2 and 4 are correct
c) 1 and 2 are correct
d) 2 and 3 are correct

40.3.4.4 (3165)
Different non-technical related opinions between pilots from different cultural backgrounds might be seen in connection with:-1 : the variations of technical training and skills.-2 : communication problems.-3 : conflicting ways of management.-4 : interpersonal problems.The combination of correct statements is:
a) 2,3 and 4 are correct
b) 1, 2 and 4 are correct
c) only 1 is correct
d) 2 and 3 are correct

40.3.4.4 (3166)
The use of modern technology applied to glass-cockpit aircraft has:
a) facilitated feedback from the machine via more concise data for communication on the flight deck
b) considerably improved all the communication facilities of the crew
c) reduced the scope for non-verbal communication in interpersonal relations
d) improved man-machine communication as a result of flight sensations

40.3.4.4 (3167)
In a glass-cockpit aircraft, communication between the members of the crew:
a) does not loose its importance
b) will increase as a result of the increase of technical dissemination of information
c) will be hampered by the decrease in actions brought about by technical improvements
d) are facilitated from the non-verbal point of view owing to the increased availability wich results from technical lightening of the workload

40.3.4.4 (3168)
What are the communication qualities of a good briefing?A good briefing must:-1 : contain as much information and be as comprehensive as possible.-2 : be of a standard type so that it can be reused for another flight of the same type.-3 : be short and precise.-4 : be understandable to the other crew member(s).The correct statement(s) is (are):
a) 2,3 and 4 are correct
b) 1 and 2 are correct
c) 1, 2 and 4 are correct
d) 1 and 4 are correct

40.3.4.4 (3169)
Of the following statements, select those which apply to ""information"".-1 : It is said to be random when it is not intended for receivers.-2 : It is intended to reduce uncertainty for the receiver.-3 : It is measured in bits.-4 : Each bit of information reduces uncertainty by a quarter.The correct statement(s) is (are):
a) 2 and 3 are correct
b) 1,2,3 and 4 are correct
c) 2,3 and 4 are correct
d) only 1 is correct

40.3.4.4 (3170)
Success in achieving the objectives of a message requires:
a) the matching of verbal, non-verbal and contextual meanings
b) differences in contexts for the sender and the receiver
c) a form of the message, which should not match the expectation of the receiver
d) different codes between form and meaning

40.3.4.4 (3171)
In order to make communication effective, it is necessary to: -1 : avoid the synchronization of verbal and non-verbal channels.-2 : send information in line with the receiver's decoding abilities.-3 : always concentrate on the informational aspects of the message only.-4 : avoid increasing the number of communication channels, in order to simplify communication.The correct statement(s) is (are):
a) only 2 is correct
b) 1,2 and 3 are correct
c) 3 and 4 are correct
d) 2 and 4 are correct

40.3.4.4 (3172)
Which of the following statements regarding interpersonal interactions are correct?-1 If the sender finds the receiver competent, he/she tends to reduce verbal redundancy content of his sentences-2 If the interlocuter is of non-native

tongue, the sender will reinforce what he is saying by using more complicated words so as to optimize understanding-3 If he/she finds him incompetent, he tends to simplify the content of sentences-4 Simplification of check list in a crew who know each other essentially takes place in the case of interpersonal conflictThe correct statement(s) is (are):
a) 1 and 3 are correct
b) 1 and 2 are correct
c) 2 and 3 are correct
d) 3 and 4 are correct

40.3.4.4 (3173)
Professional languages have certain characteristics, for example: -1 : They use a limited vocabulary .-2 : They are rich and adapted to the context, which sometimes lead to ambiguities.-3 : Their grammar is rather complicated and complex.-4 : Context provides meaning, therefor reduces the risk of ambiguities.The correct statement(s) is (are):
a) 1 and 4 are correct
b) 1 and 3 are correct
c) 2 and 3 are correct
d) only 4 is correct

40.3.4.4 (3174)
A study by NASA has examined the relationships between incidents linked with ground-to-crew communication. Which of the following factors is the main reason for disturbances in the correct reception of a message?
a) Listening errors.
b) Errors in understanding clearance values.
c) Radio failure.
d) Mother tongue differing from working language.

40.3.4.4 (3175)
An increase in workload usually leads to:
a) a shorter and less frequent exchange of information
b) a longer and less frequent exchange of information
c) a shorter and more frequent exchange of information
d) a longer and more frequent exchange of information

40.3.4.4 (3176)
Which of the following solutions represent antidotes to conflicts ?1. Seeking arbitration2. Actively listening to other people3. Abandoning facts so as to move the conversation to a more emotional level4. Becoming aware of cultural influences
a) 1,2,4
b) 1,2,3
c) 2,3,4
d) 2,4

40.3.4.4 (3177)
Which of the following statements concerning conflicts is correct ?
a) Conflict management involves the participation of all involved parties in finding an acceptable collective solution
b) Whatever the cause of the conflict, its resolution must necessarily involve an additional party if it is to be effective
c) Conflicts are negative in themselves and can only lead to a general detachment of involved parties
d) The emergence of a conflict always results from calling into question the general abilities of one of the involved parties

40.3.5.0 (3178)
With regard to the average influence of age on pilot performance, it may be said that age:
a) has little impact when the pilot is able to compensate for it by his/her flight experience
b) sharply reduces performance without, however, affecting cognitive capabilities
c) has a major impact owing to the impairment of memory
d) increases in impact as speed of thought and memory deteriorate

40.3.5.1 (3179)
Attitudes are defined as:
a) tendencies to respond to people, institutions or events either positively or negatively
b) the conditions necessary for carrying out an activity
c) the genetic predispositions for thinking and acting
d) a synonym for behaviour

40.3.5.1 (3180)
Which of the following behaviours is most disruptive to teamwork under high workload conditions in the cockpit?
a) Mentally absent.
b) Sensitive.
c) Disciplined.
d) Jovial.

40.3.5.1 (3181)
Contrary to a person's personality, attitudes:
a) Are the product of personal disposition and past experience with reference to an object or a situation
b) form part of personality and that, as a result, they cannot be changed in an adult
c) are non-evolutive adaptation procedures regardless of the result of the actions associated with them
d) are essentially driving forces behind changes in personality

40.3.5.1 (3182)
Which of the following elements make up the personality of an individual ?1. Heredity2. Childhood environment3. Upbringing4. Past experience
a) 1,2,3,4
b) 1,2,4
c) 2,3
d) 2,3,4

40.3.5.1 (3183)
The effectiveness of the individual depends on:

a) the ability to balance the dictates of the individual's needs and the demands of reality
b) the ability to repress the dictates of needs
c) the ability to go beyond one's own capabilities
d) the total independence with respect to the environment

40.3.5.2 (3184)
Very high ambition and need for achievement
a) disturbe the climate of cooperation
b) fulfil the requirements of stress resistance
c) always promote teamwork
d) improves the coping process with personal failures

40.3.5.2 (3185)
Which of the following personality characteristics makes crew decision making most effective?
a) Assertiveness.
b) Competitiveness.
c) General intelligence.
d) Friendliness.

40.3.5.2 (3186)
A copilot has passed an upgrading course to become a captain. Which psychological consequence is most likely?
a) His/her self-concept is going to change because of new roles and tasks which have to be incorporated.
b) His/her self -concept is going to be stabilized because of the higher status as a captain.
c) The increased command authority leads to a higher professionalism.
d) An upgrading does not have any of the mentioned psychological consequences.

40.3.5.3 (3187)
Which of the following responses lists most of the common hazardous thought patterns (attitudes) for pilots to develop?
a) Anti-authority, impulsiveness, invulnerabilty, resignation, machismo complex
b) Invulnerability, underconfidence, avoidance of making decisions, lack of situational awareness
c) Machismo complex, resignation, confidence, self critcism
d) Resignation, confidence, inattention

40.3.5.3 (3188)
Which of the following is NOT an hazardous attitude?
a) Domination
b) Macho
c) Anti-authority
d) Impulsivity

40.3.6.1 (3189)
The relationship between arousal and flying performance is
a) approximately the form of an inverted U
b) approximately linear increasing
c) approximately exponential
d) approximately sinusoidal

40.3.6.1 (3190)
In a complex task high levels of arousal
a) narrow the span of attention
b) improve performance
c) lead to better decision-making
d) reduce failures

40.3.6.1 (3191)
A high level of motivation is related
a) to high levels of arousal
b) to high levels of intelligence
c) to complacency
d) to monotony states

40.3.6.1 (3192)
If during flight a pilot is in a mental condition of ""optimum arousal"" he/she will be:
a) prepared best to cope with a difficult task
b) unprepared to handle a difficult situation
c) approaching a condition of complacency or fatigue
d) in a confused mental state

40.3.6.1 (3193)
Please check the following statements:1. A stressor causes activation 2. Activation stimulates a person to cope with it
a) 1 and 2 are both correct
b) 1 is correct, 2 is not correct
c) 1 is not correct, 2 is correct
d) 1 and 2 are both not correct

40.3.6.1 (3194)
An identical situation can be experienced by one pilot as exciting in a positive sense and by another pilot as threatening. In both cases:
a) the arousal level of both pilots will be raised
b) both pilots will loose their motor-coordination
c) both pilots will experience the same amount of stress
d) the pilot feeling threatened, will be much more relaxed, than the pilot looking forward to what may happen

40.3.6.2 (3195)
What are easily observable indications of stress?
a) Perspiration, flushed skin, dilated pupils, fast breathing.
b) Lowering of the blood pressure.
c) Faster, deep inhalation, stabbing pain around the heart.
d) Rising of the blood pressure, pupils narrowing, stabbing pain around the heart.

40.3.6.2 (3196)
Which of the following statements is true?
a) Stressors accumulate thus increasing the likelihood to exhaustion.
b) Stressors are independent from each other.
c) Stress should always be avoided under any circumstances.
d) People are capable of living without stress.

40.3.6.2 (3197)
How should a pilot react, when suffering from chronic stress?
a) Attempt to reduce the stress by using a concept which approaches the entire body and improves wellness.
b) Use moderate administration of tranquillizers before flight.
c) Ignore the particular stressors and increase your physical exercises.
d) Always consult a psychotherapist before the next flight.

40.3.6.2 (3198)
In case of in-flight stress, one should :
a) use all available resources of the crew
b) only trust in oneself, beeing sure to know the own limits
c) demonstrate aggressiveness to stimulate the crew
d) always carry out a breathing exercise

40.3.6.2 (3199)
The behavioural effects of stress may include :-1 : manifestation of aggressiveness.-2 : a willingness to improve communication.-3 : a willingness for group cohesion.-4 : a tendency to withdrawl.-5 : inappropriate gestural agitation.The combination of correct statements is :
a) 1,4 and 5 are correct
b) 1 and 4 are correct
c) 1,2 and 3 are correct
d) 2,4 and 5 are correct

40.3.6.2 (3200)
The cognitive effects of stress may include :-1 : excessive haste.-2 : an improvement in memory.-3 : a complete block: action is impossible.-4 : a risk of focusing on a particular aspect.-5 : ease of decision-making.-6 : an increase in the rate of mistakes.The combination which brings together all correct statements is :
a) 1,3,4,6
b) 1,2,5
c) 2,3,5,6
d) 3,4,5

40.3.6.2 (3201)
What is the effect of stress on performance ?-1 : It always reduces performance.-2 : Optimum performance is obtained with optimum arousal.-3 : Excessive stress weakens performance.-4 : Insufficient stress weakens performance.The combination of correct statements is:
a) 2,3,4
b) 1,2,3
c) 1,3,4
d) 1,2,4

40.3.6.2 (3202)
What are the characteristics of the alarm phase of the stress reactions?-1 : increased arousal level as a result of adrenaline secretion.-2 : an increase in heart rate, respiration and release of glucose.-3 : a decrease in stress resistance.-4 : activation of the digestive system.-5 : secretion of cortisol to mobilize attention.The combination of correct statements is:
a) 1,2,3
b) 1,2
c) 2,4,5
d) 1,3,5

40.3.6.2 (3203)
What are the three phases of General Adaptation Syndrome ?
a) Alarm, resistance, exhaustion.
b) Alert, resistance, performance.
c) alarm, resistance, performance,
d) alert, resistance, exhaustion

40.3.6.2 (3204)
The organism is mobilized by a process known as:
a) GAS : General Adaptation Syndrome
b) NAS : Natural Adaptation Syndrome
c) GMS : General Mobilization Syndrome.
d) GAF : General Adaptation Function.

40.3.6.2 (3205)
What is the most decisive factor in regard to a very demanding stress situation?
a) The subjective evaluation of the situation by the individual.
b) The time available to cope with the situation.
c) The objective threat of the situation.
d) The unexpected outcome of the situation.

40.3.6.2 (3206)
Stress appears:-1 : only in a situation of imminent danger.-2 : only when faced with real, existing and palpable phenomenon.-3 : sometimes via imagination, the anticipation of a situation or its outcome.-4 : because of the similarity with a formerly experienced stressful situationThe correct statement(s) is (are):
a) 3,4
b) 1,2
c) 2, 3
d) 1,2,4

40.3.6.2 (3207)
Cognitive evaluation which leads to stress is based on:
a) the evaluation of the situation and the evaluation of capabilities to cope with it
b) the evaluation of the situation and the the state of fatigue of the individual
c) the evaluation of the capabilities of the individual and the time available
d) the capabilities of the individual and the solutions provided by the environment

40.3.6.2 (3208)
Which of the following physical stimuli may cause stress reactions?-1 : noise.-2 :

interpersonnal conflict.-3 : temperature.-4 : administrative problem.-5 : hunger.The combination of correct statements is:
a) 1,3,5
b) 1,3,4
c) 3,4,5
d) 2,3,5

40.3.6.2 (3209)
Which of the following statements concerning stress is correct?
a) Stress will be evaluated differently depending on whether it improves or reduces performance.
b) Stress always creates a state of high tension which decreases cognitive and behavioural performance.
c) Stress is evaluated as a positiv mechanism only in connection with precise tasks of the kind encountered in aeronautics
d) Stress is a necessary way of demonstrating one's own work.

40.3.6.2 (3210)
Acute stress quickly leads to
a) the mobilization of resources required to cope with the stressor
b) a decrease in the amount of resources mobilized to face the situation
c) a permanent state of incapacitation
d) a state of overactivation beyond the control of willpower

40.3.6.2 (3211)
The resistance phase of stress reaction is characterized by:-1 : activation of the autonomic nervous system (ANS).-2 : testosterone secretion which enables fats to be converted into sugar.-3 : a sudden fall in stress resistance.-4 : the appearance of psychosomatic disorders when lasting over a prolonged time.The combination of correct statements is:
a) 1 and 4 are correct
b) 1,2 and 3 are correct
c) 2 , 3 and 4 are correct
d) 3 and 4 are correct

40.3.6.2 (3212)
Stress may be defined as:
a) a normal phenomenon which enables an individual to adapt to encountered situations
b) a poorly controlled emotion which leads to a reduction in capabilities
c) a psychological phenomenon which only affects fragile personalities
d) a human reaction which one must manage to eliminate

40.3.6.2 (3213)
What is a stressor?
a) An external or internal stimulus which is interpreted by an individual as beeing stressful
b) All external stimulation are stressors since they modify the internal equilibrium
c) A psychological problem developed in a situation of danger
d) The adaptation response of the individual to his environment

40.3.6.2 (3214)
What triggers stress in humans?
a) The subjective interpretation an individual gives to a situation experienced
b) Objective stimulation from the environment regards of subjective perceptions
c) Only strong excitations of the sensory organs: a flash of light, noise, the smell of smoke
d) Always the awareness of an emotion and a physiological activation (e. g. rapide heart rate)

40.3.6.2 (3215)
In relation to the word ´stress´as it affects human beings, which of the following responses is correct?
a) ´Stress´is a term used to describe how a person reacts to demands placed upon him/her.
b) All forms of stress should be avoided.
c) Reactive stressors relate purely to a pilot´s physical condition.
d) Self imposed obligations will not create stress.

40.3.6.2 (3216)
Workload essentially depends on:
a) the current situation, the pilot's expertise and the ergonomics of the system
b) the pilot's experience and the ergonomics of the system
c) the pilot's knowledge
d) the task and the day's parameters (weather report, aircraft load, type of flight, etc)

40.3.6.2 (3217)
Which of the following statements in regard to motivation is correct?
a) Extremely high motivation in combination with excessive stress will limit attention management capabilities
b) Too much motivation may result in hypovigilance and thus in a decrease in attention
c) Motivation will reduce the task automation process
d) Low motivation will guarantee adequate attention management capabilities

40.3.6.2 (3218)
What are the effects of distress (overstress) ?
a) It increases vigilance for a longer period than stress itself, but may focus attention
b) It reduces vigilance and focusses attention
c) It activates resources stored in memory
d) It has very little immediate effect on vigilance and attention

40.3.6.2 (3219)
Pilot stress reactions :
a) differ from pilot to pilot, depending on how a person manages the particular stressors
b) seem to be always the same for most pilots
c) are related to an internationally recognized list of stressors where the top-ten items should be avoided by all means
d) do not change with the environment or different situations but mainly with the characters themselves

40.3.6.2 (3220)
Fixation or tunnel vision is primarily to be expected when :

a) stress is high
b) stress is medium
c) stress and motivation are medium
d) stress and motivation are low

40.3.6.2 (3221)
The maintenance of man's internal equilibrium is called :
a) Homeostasis
b) Heterostasis
c) Homeothermy
d) Poikilothermy

40.3.6.2 (3222)
A stress reaction is:
a) the non-specific response of the body to every demand placed on a person
b) the specific response of the body to every demand placed on a person
c) the non-specific stimuli causing a human body to respond
d) the specific stimuli causing a human body to respond

40.3.6.2 (3223)
Stress is above all :
a) the best adaptation phenomenon that man possesses for responding to the various situation which he may have to face
b) a psychosomatic disease that one can learn to control
c) a response by man to his problems, which automatically leads to a reduction in his performance
d) a phenomenon which is specific to modern man

40.3.6.2 (3224)
Experiencing stress depends on:
a) the individual interpretation of the situation
b) the fragility of individuals to certain types of stimulation
c) the individual's state of tiredness
d) the environment of the situation which the individual will live through or is in the process of living through

40.3.6.2 (3225)
Stress is a reaction to adapt a specific situation.This reaction
a) may include various psychological and physiological elements which one can learn to manage
b) is always linked to excessive fear
c) can only be controlled by medical treatment
d) is purely physiological and automatic

40.3.6.2 (3226)
The individual's perception of stress depends on:
a) the subjectiv evaluation of the situation and one's abilities to cope with it
b) the objectiv evaluation of the situation and one's abilities to cope with it
c) the pilot's increasing level of arousal
d) the conditions of the current situation only

40.3.6.2 (3227)
Stress is a response which is prompted by the occurence of various stressors. Of these, which can be called physiological ?
a) Noise, temperature (low or high), humidity, sleep deprivation
b) Noise, hunger, conflicts, a death
c) Heat, humidity, fatique, administrative problems
d) Temperature, hunger, thirst, divorce

40.3.6.2 (3228)
General Adaptation Syndrome is characterised by the following phases :-1 : alarm-2 : alert phase-3 : resistance phase-4 : exhaustion phase-5 : vigilance phase
a) 1,3,4
b) 2,3,4
c) 1,2,4,5
d) 2,3,4,5

40.3.6.2 (3229)
A person being exposed to extreme or prolonged stress factors can perceive:
a) distress (stress reactions)
b) coping stress
c) eustress
d) stressors

40.3.6.2 (3230)
Getting uneasy will effect:1. attention2. concentration 3. memory 4. prudence
a) 1, 2, 3 and 4 are correct
b) 1 and 2 are correct
c) 1 and 3 are correct
d) 2, 3 and 4 are correct

40.3.6.2 (3231)
The biological reaction to stress is identical regardless of the cause of stress. This mechanism occurs in three phases and is referred to, by Selye, as the ""General Adaptation Syndrome"". The sequence is:
a) alarm phase - resistance phase - exhaustion phase
b) alarm phase - denial phase - exhaustion phase
c) exhaustion phase - resistance phase - adaptation phase
d) resistance phase - exhaustion phase - recovery phase

40.3.6.2 (3232)
According to the different phases of the ""General Adaptation Syndrom"" check the following statements:1. During the alarm phase stress hormones (i.e. adrenalin) will cause a massiv release of glucose into the blood, an acceleration of pulse and blood pressure as well as an increase in the rate and depth of breathing2. During the resistance phase the parasympathetic system uses a different type of hormone (cortisol) assisting to convert fat into sugar thus providing sufficient energy supply to the brain and body cells for sustained operation.3. During the exhaustion phase the body has to be given time to eliminate the waste products which have been generated excessively during the two preceeding phases,
a) 1,2 and 3 are correct
b) 1 and 2 are correct, 3 is false

c) only 1 is correct
d) 2 and 3 are correct, 1 is false

40.3.6.2 (3233)
1. Adaptation is a new state of equilibrium after having coped with a stressful situation. 2. An individual's prospect of the situation and his/her abilities to cope with it will determine the type and strength of stress.
a) 1 and 2 are both correct
b) 1 is correct, 2 is false
c) 1 is false, 2 is correct
d) 1 and 2 are both false

40.3.6.2 (3234)
Learning to fly naturally induces stress in a student pilot because he is lacking experience. Manifestations of this type of stress are:1. nervousness and chanellized attention2. being rough at the controls3. smoke and drink much more alcohol than usual4. airsickness, lack of sleep
a) 1 and 2 are correct, 3 and 4 are false
b) 1 and 2 are false, 3 and 4 are correct,
c) 1, 2 and 3 are correct, 4 is false
d) 1, 2 and 4 are correct, 3 is false

40.3.6.2 (3235)
The level at which a pilot will experience a situation as stressful
a) depends on the individual's perception of available abilities in comparison to the situational demands
b) does not depend on his capacity to absorb information
c) depends on the level of demand but not on individual interpretation of the situational demands
d) depends on self-confidence alone

40.3.6.2 (3236)
Please check the following statements:1. Psychosomatic means that mental and/or emotional stressors can be manifested in organic stress reactions.2. Psychosomatic means that a physical problem is always followed by psychological stress.
a) 1 is correct, 2 is false
b) 1 and 2 are both correct
c) 1 is false, 2 is correct
d) 1 and 2 are both false

40.3.6.2 (3237)
1. Psychosomatic means that a physiological problem is followed by psychological stress. 2. Psychosomatic complaints hardly occur in professional aviation because of the strict selection for this particular profession .
a) 1 and 2 are both not correct
b) 1 and 2 are both correct
c) 1 is correct 2 is not correct
d) 1 is not correct 2 is correct

40.3.6.3 (3238)
A fatigued pilot
a) will show signs of increased irritability
b) is acting similar as when encountering a state of depression
c) will get precordial pain
d) considerably increases the ability to concentrate

40.3.6.3 (3239)
What is the effect of tiredness on attention ?
a) It reduces the ability to manage multiple matters
b) It increases the ability to manage multiple matters
c) It leads to one's attention being dispersed between different centres of interest
d) It has no specific effects on attention

40.3.6.3 (3240)
Which of the following statements concerning tiredness is correct ?
a) Tiredness is a subjective sensation which is reflected in hypovigilance or in poor management of intellectual capabilities
b) Tiredness is always the result of an intellectual overload
c) Tiredness is the consequence of a diminution of performance
d) Tiredness is an objective psychophysiological symptom of a reduction in attention capabilities

40.3.6.4 (3241)
In order to completely resynchronise with local time after zone crossing, circadian rhythms require
a) less time when flying from east to west
b) more time when flying from east to west
c) about one day per 2.5 hours of time shift
d) about one week per 2.5 hours of time shift

40.3.6.4 (3242)
Flying from Frankfurt to Moscow you will have a lay-over of 4 days. What time measure is relevant for your circadian rhythm on the 3. day?
a) LT (local time).
b) MEZ (middle european time).
c) ZT (zonal time).
d) UTC (universal time coordinated).

40.3.6.4 (3243)
The readjustment of the biological rhythms after a time shift is normally more difficult
a) with flights towards the East
b) with flights towards the West
c) with flights towards the North
d) with flights towards the South

40.3.6.4 (3244)
During paradoxical sleep
a) rapid eye movements can be observed
b) the tone of the muscles is similar to that in the waking state
c) respiration is very regular
d) the rhythm of the heart is very regular

40.3.6.4 (3245)
The physiological rhythms of a pilot in a new time zone will resynchronise to this new time zone at a rate of about
a) 1 - 1.5 hours a day
b) 2 - 2.5 hours a day
c) 3 - 3.5 hours a day
d) 4 - 4.5 hours a day

40.3.6.4 (3246)
The duration of a period of sleep is governed primarily by
a) the point within your circadian rhythm at which you try to sleep
b) the duration of your previous sleep
c) the amount of time you have been awake
d) the number of points you have in your 'credit/deficit' system

40.3.6.4 (3247)
Of the following statements concerning the effects of circadian rhythms on performance, we know that :
a) Sensorimotor performance is better in the evening whereas intellectual performance is better in the morning
b) Sensorimotor performance is better in the morning whereas intellectual performance is better in the evening
c) Sensorimotor and intellectual performance are better in the morning and are sensitive to the duration of the sleep state
d) Sensorimotor and intellectual performance are better in the evening and very sensitive to the duration of the waking period

40.3.6.4 (3248)
In order to minimize the effects of crossing more than 3-4 time zones with a layover more than 24 hrs, it is advisable to :1. Adapt as quickly as possible to the rhythm of the arrival country2. Keep in swing with the rhythm of the departure country for as long as possible3. Maintain regular living patterns (waking ,sleeping alternation and regular meal pattern)4. Try to sleep as much as possible to overcome negative arousal effects
a) 2,3
b) 1,3
c) 2,4
d) 1,4

40.3.6.4 (3249)
Concerning circadian rhythm disruption (jet lag), the effects of adjustment to destination time :1. are longer for western rather than eastern flights2. are longer for eastern rather than western flights3. vary little between individuals4. may vary greatly between individuals
a) 2,4
b) 1,3
c) 1,4
d) 2,3

40.3.6.4 (3250)
What seem to be the main roles of deep sleep ?
a) It essentially allows for physical recovery and the reconstitution of neuron energy reserves
b) It is confined to physical recuperation associated with fatigue
c) Its main role is associated with activities of memory activities and restoration of attention capabilities
d) Via physical recovery, it is characterised by an alternation of dream phases and paradoxical phases

40.3.6.4 (3251)
What are the main effects of a lack of sleep loss on performance ?
a) It increases fatigue, concentration and attention difficulties, the risk of sensory illusions and mood disorders
b) It increases fatigue and concentration difficulties, but facilitates stress management by muscular relaxation,
c) It causes muscular spasms
d) It reduces concentration and fatigue only with sleep loss greater than 48 hours

40.3.6.4 (3252)
The human circadian rhythm is based on a cycle of about:
a) 24 hours
b) 1.5 hours
c) 12 hours
d) 48 hours

40.3.6.4 (3253)
Disturbance of the biological clock appears after a:1. bad night's sleep 2. day flight Amsterdam - New York 3. day flight Amsterdam - Johannesburg4. night flight New York - Amsterdam
a) 2 and 4 are correct
b) 1,2 and 3 are correct
c) 1 and 3 are correct
d) 1,2,3 and 4 are correct

40.3.6.4 (3254)
Sleeplessness or the disruption of sleeping patterns 1. can lead to symptoms of drowsiness, irritability and lack of concentration2. will make an individual more prone to make errors
a) 1 and 2 are both correct
b) 1 is not correct, 2 is correct
c) 1 is correct, 2 is not correct
d) 1 and 2 are both not correct

40.3.6.4 (3255)
Check the following statements:1. A person experiencing sleep loss is unlikely to be aware of personal performance degradation2. Performance loss may be present up to 20 minutes after awaking from a short sleep (nap)
a) 1 and 2 are both correct
b) 1 is correct 2 is false
c) 1 is false, 2 is correct
d) 1 and 2 are both false

40.3.6.4 (3256)
The sleep cycles repeat during the course of a night's sleep.1. Each succeeding cycle contains a greater amount of REM- sleep.2. Frequent interruption of the REM-sleep can harm a human being in the long run.
a) 1 and 2 are both correct
b) 1 is correct 2 is not correct
c) 1 is not correct 2 is correct
d) 1 and 2 are both not correct

40.3.6.4 (3257)
1. REM-sleep becomes shorter with any repeated sleep cycle during the night.2. REM-sleep is more important for the regeneration of mental and physical functions than all the other sleep stages are.
a) 1 is not correct 2 is correct
b) 1 and 2 are both correct
c) 1 is correct 2 is not correct
d) 1 and 2 are false

40.3.6.5 (3258)
Stress management programmes usually involve:
a) the prevention and/or the removal of stress
b) only the removal of stress
c) only the prevention of stress
d) the use of psychoactive drugs

40.3.6.5 (3259)
Using a checklist prior start is a contribution to
a) safety, because the concentration on the check list items will draw the pilot´s attention to flight related tasks, reducing distraction from personal stress
b) stress, because time pressure prior take-off is always present
c) workload, because using checklists will increase the pilot´s workload prior take-off
d) frustration

40.3.6.5 (3260)
The human performance is generally
a) better when relaxed, independent of the period of day
b) better very early in the morning
c) always better in the evening than in the morning
d) constant throughout the day

40.3.6.5 (3261)
What are the main strategies for adapting to time constraints ?
a) The preparation of action and the prioritisation of tasks
b) The preparation of action and time management
c) The prioritisation of tasks and the application of procedures
d) The preparation of action and the application of procedures

40.3.6.5 (3262)
If coping with a stress situation is impossible, one will remain in the state of:
a) distress
b) adaptation
c) hypoxia
d) eustress

40.3.7.0 (3263)
The performance of the man machine system is above all :
a) a combination which is based on decreasing the pilot's workload and increasing his time for supervision
b) a balanced combination between someone actively engaged in his work and automated systems which serve to control the pilot's workload
c) a combination which must make the pilot available for the sphere in which he is most qualified, namely checking departures from the normal operating range
d) a combination in which the pilot must keep the main repetitive tasks and automated systems under his control in line with rule-based behaviour

40.3.7.1 (3264)
Which of the following operations are performed more effectively by automatic systems than by people ?1. Waiting for an infrequent phenomenon2. Long term controlling of a set value (e.g holding of trajectory) 3. Monitoring to ensure that certain values are not exceeded (e.g holding of flight path) 4. Qualitative decision-making
a) 1,2,3
b) 2,4
c) 3,4
d) 2,3,4

40.3.7.1 (3265)
Which of the following drawbacks are associated with automation ?1. Reduced competence in manually controlling the aircraft2. Increased likelihood of slips while programming automatic systems 3. Difficulties in adapting to the use of a sidestick4. General decrease in technical reliability
a) 1,2
b) 1,4
c) 2,3,4
d) 1,3

40.3.7.1 (3266)
Which of the following operations are performed more effectively by people than by automatic systems ?1. Qualitative decision-making2. Waiting for an infrequent phenomenon3. Monitoring to ensure that certain values are not exceeded4. Detections of unusual conditions (smell, noise, etc.)
a) 1,4
b) 1,2
c) 3,4
d) 2,3,4

40.3.7.1 (3267)
If man is compared with a computer, it can be said that man :
a) has more effective means of action (output) and is above all capable of considerable synergy
b) has less effective means of action (output) than the computer
c) has less effective means of data collection than the computer

d) is relatively limited compared with a computer, that means of data collection or means of action are referred to

40.3.7.2 (3268)
How can a pilot avoid automation complacency?
a) Regard the automatic system as additional crew members that needs to be crosschecked as well
b) Always try to enhance your aviation related knowledge during low workload periods
c) Always fly the whole flight manually to remain in man-machine loop
d) Nothing, because it is system-inherent

40.3.7.2 (3269)
A high degree of cockpit automation may alter the traditional tasks of the pilots in a way, that
a) the attention of the cockpit crew will become reduced with the consequence of 'being out of the loop'
b) it is guaranteed that the crew maqintains always situational awareness
c) Crew Coordination can be neglected on long haul flights without compromizing safety
d) the crew can pay more attention to solve the problem in an abnormal situation without monitoring the automatic systems

40.3.7.2 (3270)
One negative aspect of the highly automated cockpit results in :
a) complacency among the crewmembers
b) pilots disregarding the automatic equipment
c) constantly high crew overload with regard to the monitoring tasks
d) less experienced crews because of more transparent system details

40.3.7.3 (3271)
As a result of automation in cockpits,
a) communication and coordination call for an even greater effort on the part of the crew members
b) man-man communication has been significantly improved
c) coordination between the members is facilitated by the provision of more precise and more important information
d) communication and coordination have clearly improved in man-man and man-machine relations

50.1.1.1 (3272)
How does the height of the tropopause normally vary with latitude in the northern hemisphere ?
a) It decreases from south to north.
b) It remains constant from north to south.
c) It increases from south to north.
d) It remains constant throughout the year.

50.1.1.1 (3273)
What, approximately, is the average height of the tropopause over the equator ?
a) 16 km
b) 8 km
c) 11 km
d) 40 km

50.1.1.1 (3274)
In which layer is most of the atmospheric humidity concentrated ?
a) Troposphere.
b) Tropopause.
c) Stratosphere.
d) Stratopause.

50.1.1.1 (3275)
What is the boundary layer between troposphere and stratosphere called?
a) Tropopause.
b) Ionosphere.
c) Stratosphere.
d) Atmosphere.

50.1.1.1 (3276)
Which of the following cloud types can project up into the stratosphere?
a) Cumulonimbus
b) Cirrostratus
c) Altocumulus
d) Altostratus

50.1.1.1 (3277)
Which one of the following statements applies to the tropopause?
a) It separates the troposphere from the stratosphere
b) It is, by definition, an isothermal layer
c) It indicates a strong temperature lapse rate
d) It is, by definition, a temperature inversion

50.1.1.1 (3278)
Which layer of the atmosphere contains more than 90 per cent of all water vapour?
a) Troposphere
b) Lower stratosphere
c) Upper stratosphere
d) Ionosphere

50.1.1.1 (3279)
The thickness of the troposphere varies with
a) latitude
b) longitude
c) rotation of the earth
d) the wind

50.1.1.1 (3280)
What is the approximate composition of the dry air by volume in the troposphere ?
a) 21 % oxygen, 78 % nitrogen, and the rest other gasses
b) 10 % oxygen, 89 % nitrogen, and the rest other gasses

71.2.13.0 (5254)
A braking action of 0.25 and below reported on a SNOWTAM is :
a) poor
b) unreliable
c) medium
d) good

71.2.13.0 (5255)
In the JAR OPS, a runway is considered damp when:
a) its surface is not dry, and when surface moisture does not give it a shiny appearance.
b) surface moisture gives it a shiny appearance.
c) it is covered with a film of water of less than 3 mm.
d) it is covered with a film of water of less than 1 mm.

71.2.13.0 (5256)
Your flight manual does not include specific supplementary information on landing distances on wet runways and the service bulletins or weather reports indicate that the runway may be wet at the estimated time of arrival. The required landing distance on a dry runway must be increased by:
a) 15%
b) 18%
c) 20%
d) 17,60%

71.2.13.0 (5257)
In the JAR OPS, a runway is refered to as contaminated when more than 25 % of the required runway surface is covered with the one of the following elements:1. a water film sufficiently thick to give a shiny appearance to the runway.2. a water film or loose or slushy snow equivalent to more than 3 mm of water.3. compacted snow (a solid mass which may not be compacted further).4. ice, including wet ice.5. moist grass.The combination regrouping all the correct statements is:
a) 2, 3, 4
b) 1, 2, 3, 4
c) 1, 3, 4
d) 1, 3, 4, 5

71.2.13.0 (5258)
The tire pressure of an aircraft main landing gear is 10,8 bars. The speed at which the hydroplaning phenomenon will appear is approximately:
a) 112 kt
b) 56 kt
c) 87 kt
d) 145 kt

81.1.1.1 (5259)
In a stationary subsonic streamline flow pattern, if the streamlines converge, in this part of the pattern, the static pressure (I) will ...and the velocity (II) will ... :
a) (I) decrease, (II) increase.
b) (I) increase, (II) increase.
c) (I) increase, (II) decrease.
d) (I) increase, (II) decrease.

81.1.1.1 (5260)
The units of the density of the air (I) and the force (II) are:
a) (I) kg / m3, (II) N.
b) (I) kg / m², (II) kg.
c) (I) N / m3, (II) N.
d) (I) N / kg, (II) kg.

81.1.1.1 (5261)
The units of wing loading (I) W / S and (II) dynamic pressure q are:
a) (I) N / m², (II) N / m².
b) (I) N / m3, (II) kg / m².
c) (I) kg / m, (II) N / m².
d) (I) N / m, (II) kg.

81.1.1.1 (5262)
Which formula or equation describes the relationship between force (F), acceleration (a) and mass (m)?
a) F=m. a
b) m=F.a
c) a=F. m
d) F=m / a

81.1.1.1 (5263)
The static pressure is acting:
a) in all directions.
b) only in direction of the flow.
c) only perpendicular to the direction of the flow.
d) only in the direction of the total pressure.

81.1.1.1 (5264)
Consider a certain stream line tube. The velocity of the stream in the tube is V. An increase of temperature of the stream at constant value of V will:
a) decrease the mass flow.
b) increase the mass flow.
c) not affect the mass flow.
d) increase the mass flow when the tube is divergent in the direction of the flow.

81.1.1.1 (5265)
Which one of the following statements about Bernoulli's theorem is correct?
a) The dynamic pressure increases as static pressure decreases.
b) The dynamic pressure decreases as static pressure decreases.
c) The total pressure is zero when the velocity of the stream is zero.
d) The dynamic pressure is maximum in the stagnation point.

81.1.1.1 (5266)
In a two-dimensional flow pattern, where the streamlines converge the static pressure will :

a) decrease.
b) increase.
c) not change.
d) increase initially, then decrease.

81.1.1.1 (5267)
Bernoulli's equation can be written as:(pt= total pressure, ps = static pressure and q=dynamic pressure)
a) pt = ps + q
b) pt = ps - q
c) pt = q - ps
d) pt = ps / q

81.1.1.1 (5268)
The unit of density is:
a) kg/m³
b) psi
c) kg/cm²
d) Bar

81.1.1.1 (5269)
The unit of measurement of pressure is:
a) psi
b) kg/m³
c) lb/gal
d) kg/dm²

81.1.1.1 (5270)
The total pressure is:
a) static pressure plus the dynamic pressure.
b) static pressure minus the dynamic pressure.
c) ½ rho V²
d) can be measured in a small hole in a surface, parallel to the local stream.

81.1.1.1 (5271)
The (subsonic) static pressure:
a) decreases in a flow in a tube when the diameter decreases.
b) is the total pressure plus the dynamic pressure.
c) is the pressure in a point at which the velocity has become zero.
d) increases in a flow in a tube when the diameter decreases.

81.1.1.1 (5272)
The true airspeed (TAS) is:
a) lower than the indicated airspeed (IAS) at ISA conditions and altitudes below sea level.
b) higher than the speed of the undisturbed airstream about the aeroplane.
c) equal to the IAS, multiplied by the air density at sea level.
d) lower than the speed of the undisturbed airstream about the aeroplane.

81.1.1.1 (5273)
The difference between IAS and TAS will:
a) decrease at decreasing altitude.
b) increase at decreasing temperature.
c) increase at increasing air density.
d) decrease at increasing speed.

81.1.1.1 (5274)
What is the unit of measurement for power ?
a) Nm/s
b) kgm/s²
c) Pa/m²
d) N/m

81.1.1.1 (5275)
The following unit of measurement: kgm/s² is expressed in the SI-system as :
a) Newton
b) Pascal
c) Joule
d) Watt

81.1.1.1 (5276)
The continuity equation states: If the area of a tube is increasing, the speed of the subsonic and incompressible flow inside is
a) decreasing.
b) not changing.
c) increasing.
d) sonic.

81.1.1.1 (5277)
If the continuity equation is applicable, what will happen to the air density (rho) if the cross sectional area of a tube changes ? (low speed, subsonic and incompressible flow)
a) rho1 = rho2
b) rho1 < rho2
c) rho1 > rho2
d) The density depends on the change of the tube area.

81.1.1.1 (5278)
Bernoulli's equation can be written as :(pt = total pressure, ps = static pressure, q = dynamic pressure)
a) pt - q = ps
b) pt = ps - q
c) pt + ps = q
d) pt = q - ps

81.1.1.1 (5279)
Which of the following statements, about a venturi in a sub-sonic airflow are correct?1. the dynamic pressure in the undisturbed flow and in the throat are equal.2. the total pressure in the undisturbed flow and in the throat are equal.
a) 1 is incorrect and 2 is correct.

b) 1 and 2 are correct.
c) 1 is correct and 2 is incorrect.
d) 1 and 2 are incorrect.

81.1.1.3 (5280)
The angle between the airflow (relative wind) and the chord line of an aerofoil is:
a) angle of attack.
b) glide path angle.
c) climb path angle.
d) same as the angle between chord line and fuselage axis.

81.1.1.3 (5281)
Considering a positive cambered aerofoil, the pitch moment when Cl=0 is:
a) negative (pitch-down).
b) equal to zero.
c) infinite
d) positive (pitch-up).

81.1.1.3 (5282)
On a symmetrical aerofoil, the pitch moment for which Cl=0 is:
a) zero
b) equal to the moment coefficient for stabilized angle of attack.
c) positive (pitch-up)
d) negative (pitch-down)

81.1.1.3 (5283)
Drag is in the direction of - and lift is perpendicular to the:
a) relative wind/airflow.
b) chord line.
c) horizon.
d) longitudinal axis.

81.1.1.3 (5284)
The correct drag formula is:
a) D= CD 1/2 RHO V^2 S
b) D= CD 2 RHO V^2 S
c) D= CD 1/2 RHO V S
d) D= CD 1/2 1/RHO V^2 S

81.1.1.3 (5285)
Lift and drag on an aerofoil are vertical respectively parallel to the
a) relative wind/airflow.
b) chord line.
c) longitudinal axis.
d) horizon.

81.1.1.4 (5286)
The angle of attack (aerodynamic angle of incidence) of an aerofoil is the angle between the:
a) chord line and the relative undisturbed airflow.
b) bottom surface and the horizontal
c) bottom surface and the relative airflow.
d) bottom surface and the chord line.

81.1.1.4 (5287)
The angle of attack of a two dimensional wing section is the angle between :
a) the chord line of the aerofoil and the free stream direction.
b) the chord line of the aerofoil and the fuselage centreline.
c) the fuselage core line and the free stream direction.
d) the chord line and the camber line of the aerofoil.

81.1.1.4 (5288)
The angle between the aeroplane longitudinal axis and the chord line is the:
a) angle of incidence.
b) glide path angle.
c) angle of attack.
d) climb path angle.

81.1.1.4 (5289)
The term angle of attack in a two dimensional flow is defined as:
a) the angle between the wing chord line and the direction of the relative wind/airflow.
b) the angle between the aeroplane climb path and the horizon.
c) the angle formed by the longitudinal axis of the aeroplane and the chord line of the wing
d) the angle for maximum lift/drag ratio

81.1.1.4 (5290)
Which statement is correct about the Cl and angle of attack?
a) for a symmetric aerofoil, if angle of attack = 0, Cl =0
b) for a symmetric aerofoil, if angle of attack = 0, Cl is not equal to 0
c) for an asymmetric aerofoil, if angle of attack = 0, Cl =0
d) for an asymmetric aerofoil with positive camber, if angle of attack is greater than 0, Cl = 0

81.1.1.4 (5291)
The relative thickness of an aerofoil is expressed in:
a) % chord.
b) camber.
c) meters.
d) degrees cross section tail angle.

81.1.1.4 (5292)
""A line connecting the leading- and trailing edge midway between the upper and lower surface of a aerofoil"". This definition is applicable for :
a) the camber line
b) the chord line
c) the mean aerodynamic chord line
d) the upper camber line

81.1.1.4 (5293)
The angle of attack of a wing profile is defined as the angle between :

a) The undisturbed airflow and the chordline.
b) The local airflow and the mean camberline.
c) The local airflow and the chordline.
d) The undisturbed airflow and the mean camberline.

81.1.1.5 (5294)
The Mean Aerodynamic Chord (MAC) for a given wing of any planform is
a) the chord of a rectangular wing with same moment and lift
b) the chord of a large rectangular wing
c) the average chord of the actual aeroplane
d) the wing area divided by the wing span

81.1.1.5 (5295)
The aspect ratio of the wing:
a) is the ratio between the wing span and the mean geometric chord.
b) is the ratio between the wing span and the root chord.
c) is the ratio between the tip chord and the wing span.
d) is the ratio between chord and root chord.

81.1.1.5 (5296)
Dihedral of the wing is:
a) the angle between the 0.25 chord line of the wing and the lateral axis.
b) the angle between the leading edge of the wing and the lateral axis.
c) the angle between the 0.25 chord line of the wing and the vertical axis.
d) the angle between the 0.25 chord line of the wing and the horizon.

81.1.2.0 (5297)
(For this question use annex 081-6253A)How are the speeds (shown in the figure) at point 1 and point 2 related to the relative wind/airflow V?
a) V1 = 0 and V2 > V
b) V1 < V2 and V2 < V
c) V1 = 0 and V2 = V
d) V1 > V2 and V2 < V

81.1.2.0 (5298)
Consider an aerofoil with a certain camber and a positive angle of attack. At which location will the highest flow velocities occur ?
a) Upper side
b) Lower side
c) In front of the stagnation point
d) In the stagnation point

81.1.2.2 (5299)
With increasing angle of attack, the stagnation point will move (I) ...and the point of lowest pressure will move (II) ...Respectively (I) and (II) are:
a) (I) down, (II) forward.
b) (I) up, (II) aft.
c) (I) down, (II) aft.
d) (I) up, (II) forward.

81.1.2.2 (5300)
Which statement is correct?
a) As the angle of attack increases, the stagnation point on the wing's profile moves downwards.
b) The centre of pressure is the point on the wing's leading edge where the airflow splits up.
c) The stagnation point is another name for centre of pressure.
d) The stagnation point is always situated on the chordline, the centre of pressure is not.

81.1.2.4 (5301)
The point, where the aerodynamic lift acts on a wing is:
a) the centre of pressure.
b) the c.g. location.
c) the point of maximum thickness of the wing.
d) the suction point of the wing.

81.1.2.4 (5302)
The location of the centre of pressure of a positive cambered wing at increasing angle of attack will:
a) shift forward.
b) not shift.
c) shift aft.
d) shift in spanwise direction.

81.1.2.5 (5303)
Lift is generated when:
a) a certain mass of air is accelerated downwards.
b) the shape of the aerofoil is slightly cambered.
c) an aerofoil is placed in a high velocity air stream.
d) a certain mass of air is retarded.

81.1.2.5 (5304)
The lift force, acting on an aerofoil :
a) is mainly caused by suction on the upperside of the aerofoil.
b) increases, proportional to the angle of attack until 40 degrees.
c) is mainly caused by overpressure at the underside of the aerofoil.
d) is maximum at an angle of attack of 2 degrees.

81.1.2.7 (5305)
On an asymmetrical, single curve aerofoil, in subsonic airflow, at low angle of attack, when the angle of attack is increased, the centre of pressure will (assume a conventional transport aeroplane) :
a) move forward.
b) move aft.
c) remain matching the airfoil aerodynamic centre.
d) remain unaffected.

81.1.3.1 (5306)
The Cl - alpha curve of a positive cambered aerofoil intersects with the vertical axis of the Cl - alpha graph:
a) above the origin.
b) in the origin.

c) below the origin.
d) nowhere.

81.1.3.1 (5307)
The lift formula is:
a) L= CL 1/2 RHO V² S
b) L= W
c) L= CL 2 RHO V² S
d) L= n W

81.1.3.1 (5308)
The terms ""q"" and ""S"" in the lift formula are:
a) dynamic pressure and the area of the wing
b) square root of surface and wing loading
c) static pressure and wing surface area
d) static pressure and dynamic pressure

81.1.3.1 (5309)
The critical angle of attack:
a) remains unchanged regardless of gross weight
b) increases if the CG is moved forward
c) decreases if the CG is moved aft
d) changes with an increase in gross weight

81.1.3.1 (5310)
An aeroplane performs a straight and level horizontal flight at the same angle of attack at two different altitudes. (all other factors of importance being constant, assume ISA conditions and no compressibility effects)
a) the TAS at the higher altitude is higher
b) the TAS at both altitudes is the same
c) the TAS at the higher altitude cannot be determined
d) the TAS at the higher altitude is lower

81.1.3.1 (5311)
(For this question use annex 081-6261A)Which point shown in the figure corresponds with CL for minimum horizontal flight speed?
a) Point d
b) Point a
c) Point b
d) Point c

81.1.3.2 (5312)
The aerodynamic drag of a body, placed in a certain airstream depends amongst others on:
a) The airstream velocity.
b) The specific mass of the body.
c) The weight of the body.
d) The c.g. location of the body.

81.1.3.2 (5313)
A body is placed in a certain airstream. The airstream velocity increases by a factor 4. The aerodynamic drag will increase with a factor :
a) 16 .
b) 4 .
c) 8 .
d) 12 .

81.1.3.2 (5314)
A body is placed in a certain airstream. The density of the airstream decreases to half of the original value. The aerodynamic drag will decrease with a factor :
a) 2 .
b) 4 .
c) 8 .
d) 1.4 .

81.1.3.2 (5315)
Comparing the lift coefficient and drag coefficient at normal angle of attack:
a) CL is much greater than CD
b) CL has approximately the same value as CD
c) CL is lower than CD
d) CL is much lower than CD

81.1.3.2 (5316)
The polar curve of an aerofoil is a graphic relation between :
a) CL and CD
b) TAS and stall speed
c) Angle of attack and CL
d) CD and angle of attack

81.1.3.2 (5317)
The lift- and drag forces, acting on a wing cross section:
a) depend on the pressure distribution about the wing cross section.
b) are normal to each other at just one angle of attack.
c) are proportional to each other, independent of angle of attack.
d) vary linearly with the angle of attack.

81.1.3.2 (5318)
The aerofoil polar is:
a) a graph of the relation between the lift coefficient and the drag coefficient.
b) a graph of the relation between the lift coefficient and the angle of attack.
c) the relation between the horizontal and the vertical speed.
d) a graph, in which the thickness of the wing aerofoil is given as a function of the chord.

81.1.3.2 (5319)
The frontal area of a body, placed in a certain airstream is increased by a factor 3. The shape will not alter. The aerodynamic drag will increase with a factor :
a) 3 .
b) 9 .
c) 6 .
d) 1.5 .

81.1.3.2 (5320)
Increasing dynamic (kinetic) pressure will have the following effect on the drag of an aeroplane (all other factors of importance remaining constant) :
a) The drag increases.
b) This has no effect.
c) The drag decreases.
d) The drag is only affected by the ground speed.

81.1.3.2 (5321)
Increasing air pressure will have the following effect on the drag of an aeroplane (angle of attack, OAT and TAS are constant):
a) The drag increases.
b) This has no effect.
c) The drag decreases.
d) The drag is only affected by the ground speed.

81.1.3.2 (5322)
Which statement is correct? The lift to drag ratio provides directly the
a) glide distance from a given altitude at zero wind.
b) glide distance from a given altitude.
c) distance for horizontal flight.
d) distance for climb up to a certain altitude.

81.1.4.1 (5323)
The span-wise flow is caused by the difference between the air pressure on top and beneath the wing and its direction of movement goes from :
a) beneath to the top of the wing via the wing tip
b) the top to beneath the wing via the wing's trailing edge
c) beneath to the top of the wing via the trailing edge
d) the top to beneath the wing via the leading edge

81.1.4.1 (5324)
Which statement about induced drag and tip vortices is correct?
a) The flow direction at the upper side of the wing has a component in wing root direction, the flow at the underside of the wing in wing tip direction.
b) Tip vortices can be diminished by vortex generators.
c) The flow direction at the upper and under side of the wing, both deviate in wing tip direction.
d) The wing tip vortices and the induced drag decrease at increasing angle of attack.

81.1.4.1 (5325)
Which of the following wing planforms gives the highest local profile lift coefficient at the wingroot ?
a) Rectangular.
b) Elliptical.
c) Tapered.
d) Positive angle of sweep.

81.1.4.2 (5326)
If flaps are deployed at constant IAS in straight and level flight, the magnitude of tip vortices will eventually : (flap span less than wing span)
a) decrease.
b) increase.
c) remain the same.
d) increase or decrease, depending on the initial angle of attack.

81.1.4.2 (5327)
The value of the induced drag of an aeroplane in straight and level flight at constant weight varies linearly with:
a) $1/V^2$
b) V^2
c) V
d) 1/V

81.1.4.2 (5328)
Induced drag at constant IAS is affected by:
a) aeroplane weight.
b) aeroplane wing location.
c) angle between wing chord and fuselage centre line.
d) engine thrust.

81.1.4.2 (5329)
Which of the following will reduce induced drag?
a) Elliptical lift distribution.
b) Low aspect ratio.
c) Flying at high angles of attack.
d) Extending the flaps.

81.1.4.2 (5330)
Induced drag is created by the:
a) spanwise flow pattern resulting in the tip vortices.
b) interference of the air stream between wing and fuselage.
c) separation of the boundary layer over the wing.
d) propeller wash blowing across the wing.

81.1.4.2 (5331)
What is the effect of high aspect ratio of an aeroplane's wing on induced drag?
a) It is reduced because the effect of wing-tip vortices is reduced.
b) It is increased because high aspect ratio has greater frontal area.
c) It is unaffected because there is no relation between aspect ratio and induced drag.
d) It is increased because high aspect ratio produces greater downwash.

81.1.4.2 (5332)
Which of the following wing planforms produces the lowest induced drag? (all other relevant factors constant)
a) Elliptical.
b) Rectangular.
c) Tapered.
d) Circular.

81.1.4.2 (5333)
Induced drag may be reduced by:
a) an increase in aspect ratio
b) an increase in the taper ratio of the wing
c) a decrease of the aspect ratio
d) the use of a wing tip with a much thinner aerofoil

81.1.4.2 (5334)
The induced drag:
a) increases as the lift coefficient increases.
b) increases as the aspect ratio increases.
c) has no relation to the lift coefficient.
d) increases as the magnitude of the tip vortices decreases.

81.1.4.2 (5335)
The relationship between induced drag and the aspect ratio is:
a) a decrease in the aspect ratio increases the induced drag
b) there is no relationship
c) induced drag = 1.3 aspect ratio value
d) an increase in the aspect ratio increases the induced drag

81.1.4.2 (5336)
A high aspect ratio wing produces:
a) a decrease in induced drag
b) less sensitivity to gust effects
c) a decrease in stall speed
d) an increase in induced drag

81.1.4.2 (5337)
Excluding constants, the coefficient of induced drag (CDi) is the ratio of :
a) CL^2 and AR (aspect ratio)
b) CL and CD
c) CL and b (wing span)
d) $CL^2$and S (wing surface)

81.1.4.2 (5338)
High Aspect Ratio, as compared with low Aspect Ratio, has the effect of :
a) Decreasing induced drag and critical angle of attack
b) Increasing lift and critical angle of attack
c) Increasing lift and drag
d) Increasing induced drag and decreasing critical angle of attack

81.1.4.2 (5339)
Winglets
a) decrease the induced drag.
b) decrease the static lateral stability.
c) increase the manoeuvrability.
d) create an elliptical lift distribution.

81.1.4.2 (5340)
Which location on the aeroplane has the largest effect on the induced drag ?
a) Wing tip
b) Engine cowling
c) Wing root junction
d) Landing gear

81.1.4.2 (5341)
The induced angle of attack is the result of:
a) downwash due to tip vortices.
b) a large local angle of attack in a two dimensional flow.
c) downwash due to flow separation.
d) change in direction of flow due to the effective angle of attack.

81.1.4.2 (5342)
The induced drag coefficient, CDi is proportional with:
a) CL^2
b) CL
c) square root (CL)
d) CLmax

81.1.5.0 (5343)
(For this question use annex 081-6239A)Which one of the bodies in motion (all bodies have the same cross section area) will have lowest drag?
a) Body c
b) Body a
c) Body b
d) Body d

81.1.5.1 (5344)
The interference drag is created as a result of
a) interaction between aeroplane parts (e.g. wing/fuselage).
b) downwash behind the wing.
c) separation of the induced vortex.
d) the addition of induced and parasite drag.

81.1.5.2 (5345)
The value of the parasite drag in straight and level flight at constant weight varies linearly with the:
a) square of the speed.
b) speed.
c) angle of attack.
d) square of the angle of attack.

81.1.5.2 (5346)
In what way do (1) induced drag and (2) parasite drag alter with increasing speed?
a) (1) decreases and (2) increases.
b) (1) increases and (2) increases.
c) (1) decreases and (2) decreases.
d) (1) increases and (2) decreases.

81.1.5.3 (5347)
An aeroplane accelerates from 80 kt to 160 kt at a load factor equal to 1. The induced drag coefficient (i) and the induced drag (ii) alter with the following factors:
a) (i) 1/16 (ii) 1/4
b) (i) 1/4 (ii) 2
c) (i) 1/2 (ii) 1/16
d) (i) 4 (ii) 1/2

81.1.5.3 (5348)
What is the effect on induced drag of weight and speed changes ?
a) induced drag decreases with increasing speed and induced drag decreases with decreasing weight
b) induced drag decreases with decreasing speed and induced drag decreases with increasing weight
c) induced drag increases with increasing speed and induced drag increases with decreasing weight
d) induced drag increases with decreasing speed and induced drag increases with increasing weight

81.1.5.3 (5349)
(For this question use annex 081-6250A)The diagram shows the parameter X versus TAS. If a horizontal flight is considered the axis X shows
a) the induced drag.
b) the total drag.
c) the lift force.
d) the parasite drag.

81.1.5.5 (5350)
How does the total drag vary as speed is increased from stalling speed (VS) to maximum IAS (VNE) in a straight and level flight at constant weight?
a) Decreasing, then increasing.
b) Decreasing.
c) Increasing.
d) Increasing, then decreasing.

81.1.5.5 (5351)
Which one of the following statements about the lift-to-drag ratio in straight and level flight is correct?
a) At the highest value of the lift/drag ratio the total drag is lowest.
b) The highest value of the lift/drag ratio is reached when the lift is zero.
c) The lift/drag ratio always increases as the lift decreases.
d) The highest value of the lift/drag ratio is reached when the lift is equal to the aircraft weight.

81.1.5.5 (5352)
At an aeroplane's minimum drag speed, what is the ratio between induced drag Di and profile drag Dp? Di/Dp=
a) 01-Jan
b) It varies between aeroplane types.
c) 01-Fev
d) 02-Jan

81.1.5.5 (5353)
(For this question use annex 081-6249A)Which line represents the total drag line of an aeroplane?
a) Line c
b) Line a
c) Line b
d) Line d

81.1.5.6 (5354)
The aeroplane drag in straight and level flight is lowest when the:
a) parasite drag is equal to the induced drag.
b) parasite drag equals twice the induced drag.
c) induced drag is equal to zero.
d) induced drag is lowest.

81.1.6.0 (5355)
What will happen in ground effect ?
a) the induced angle of attack and induced drag decreases
b) the wing downwash on the tail surfaces increases
c) an increase in strength of the wing tip vortices
d) a significant increase in thrust required

81.1.6.0 (5356)
If an aeroplane flies in the ground effect
a) the lift is increased and the drag is decreased.
b) the effective angle of attack is decreased.
c) the induced angle of attack is increased.
d) drag and lift are reduced.

81.1.6.4 (5357)
Floating due to ground effect during an approach to land will occur :
a) when the height is less than halve of the length of the wing span above the surface
b) when the height is less than twice the length of the wing span above the surface
c) when a higher than normal angle of attack is used
d) at a speed approaching the stall

81.1.6.4 (5358)
Ground effect has the following influence on the landing distance :
a) increases.
b) decreases.
c) does not change.
d) increases, only if the landing flaps are fully extended.

81.1.7.1 (5359)
An aeroplane maintains straight and level flight while the IAS is doubled. The change in lift coefficient will be:

a) x 0.25
b) x 2.0
c) x 0.5
d) x 4.0

81.1.7.1 (5360)
When an aeroplane is flying at an airspeed which is 1.3 times its basic stalling speed, the coefficient of lift as a percentage of the maximum lift coefficient (CLmax) would be:
a) 59%.
b) 130%.
c) 169%.
d) 77%.

81.1.8.1 (5361)
Which of the following statements about boundary layers is correct?
a) The turbulent boundary layer has more kinetic energy than the laminar boundary layer.
b) The turbulent boundary layer is thinner than the laminar boundary layer.
c) The turbulent boundary layer gives a lower skin friction than the laminar boundary layer.
d) The turbulent boundary layer will separate more easily than the laminar boundary layer.

81.1.8.1 (5362)
Where on the surface of a typical aerofoil will flow separation normally start at high angles of attack?
a) upper side trailing edge.
b) upper side leading edge.
c) lower side trailing edge.
d) lower side leading edge.

81.1.8.1 (5363)
The boundary layer of a wing is caused by:
a) a layer on the wing in which the stream velocity is lower than the free stream velocity, due to friction.
b) the normal shock wave at transonic speeds.
c) a turbulent stream pattern around the wing.
d) suction at the upper wing side.

81.1.8.1 (5364)
A laminar boundary layer is a layer, in which:
a) no velocity components exist, normal to the surface.
b) the vortices are weak.
c) the velocity is constant.
d) the temperature varies constantly.

81.1.8.1 (5365)
Compared with level flight prior to the stall, the lift (1) and drag (2) in the stall change as follows :
a) (1) decreases (2) increases.
b) (1) decreases (2) decreases.
c) (1) increases (2) increases.
d) (1) increases (2) decreases.

81.1.8.1 (5366)
Entering the stall the centre of pressure of a straight (1) wing and of a strongly swept back wing (2) will:
a) (1) move aft, (2) move forward.
b) (1) move aft, (2) move aft.
c) (1) not move (2) move forward.
d) (1) move aft, (2) not move.

81.1.8.1 (5367)
Which of the following statements about the stall of a straight wing aeroplane is correct?
a) Just before the stall the aeroplane will be have a nose-down tendency.
b) Buffeting is the result of flow separation on the tail plane.
c) The nose down effect is the result of increasing downwash, due to flow separation.
d) The horizontal tail will stall at a higher speed than the wing.

81.1.8.1 (5368)
Which statement is correct about the laminar and turbulent boundary layer :
a) friction drag is lower in the laminar layer
b) friction drag will be equal in both types of layers
c) friction drag is lower in the turbulent layer
d) separation point will occur earlier in the turbulent layer

81.1.8.1 (5369)
After the transition point between the laminar and turbulent boundary layer
a) the mean speed and friction drag increases
b) the boundary layer gets thinner and the speed increases
c) the mean speed increases and the friction drag decreases
d) the boundary layer gets thicker and the speed decreases

81.1.8.1 (5370)
Which kind of boundary layer has the strongest change in velocity close to the surface?
a) Turbulent boundary layer
b) Laminar boundary layer
c) No difference
d) Transition boundary layer

81.1.8.2 (5371)
The stall speed in a 60° banked turn increases by the following factor:
a) 1.41
b) 1.07
c) 1.30
d) 2.00

81.1.8.2 (5372)
In a turn, the load factor n and the stalling speed VS will be:

a) n greater than 1, VS higher than in straight and level flight.
b) n smaller than 1, VS lower than in straight and level flight.
c) n greater than 1, VS lower than in straight and level flight.
d) n smaller than 1, VS higher than in straight and level flight.

81.1.8.2 (5373)
A jet aeroplane cruises buffet free at high constant altitude in significant turbulence. Which type of stall can occur if this aeroplane decelerates?
a) Accelerated stall.
b) Low speed stall.
c) Shock stall.
d) Deep stall.

81.1.8.2 (5374)
Which of the following situations leads to a decreasing stall speed (IAS)?
a) decreasing weight.
b) increasing altitude.
c) increasing air density.
d) increasing load factor.

81.1.8.2 (5375)
Two identical aeroplanes A and B are flying horizontal steady turns. Further data are:A:W= 1500 kgBank= 20°TAS= 130 ktB:W= 1500 kgBank= 20°TAS= 200 ktWhich of the following statements is correct?
a) The rate of turn A is larger than the rate of turn B.
b) The load factor A is larger than the load factor B.
c) The turn radius A is larger than the turn radius B.
d) The lift coefficient A is smaller than the lift coefficient B.

81.1.8.2 (5376)
Increase of wing loading will:
a) increase the stall speeds.
b) decrease the minimum gliding angle.
c) increase CLmax.
d) decrease take off speeds.

81.1.8.2 (5377)
The stall speed :
a) increases with an increased weight
b) decreases with an increased weight
c) does not depend on weight
d) increases with the length of the wingspan

81.1.8.2 (5378)
When a pilot makes a turn in horizontal flight, the stall speed :
a) increases with the square root of load factor
b) increases with flap extension
c) decreases with increasing bank angle
d) increases with the load factor squared

81.1.8.2 (5379)
An aeroplane has a stall speed of 78 KCAS at its gross weight of 6850 Ibs. What is the stall speed when the weight is 5000 Ibs ?
a) 67 KCAS
b) 91 KCAS
c) 78 KCAS
d) 57 KCAS

81.1.8.2 (5380)
An aeroplane has a stall speed of 100 kt at a load factor n=1. In a turn with a load factor of n=2, the stall speed is:
a) 141 kt
b) 282 kt
c) 70 kt
d) 200 kt

81.1.8.2 (5381)
The following factors increase stall speed :
a) an increase in load factor, a forward c.g. shift, decrease in thrust.
b) a higher weight, selecting a higher flap setting, a forward c .g. shift.
c) increasing bank angle, increasing thrust, slat extension.
d) a lower weight, decreasing bank angle, a smaller flapsetting.

81.1.8.2 (5382)
The wing of an aeroplane will never stall at low subsonic speeds as long as....
a) the angle of attack is smaller than the value at which the stall occurs.
b) the IAS exceeds the power-on stall speed.
c) the CAS exceeds the power-on stall speed.
d) there is a nose-down attitude.

81.1.8.2 (5383)
The stall speed increases, when: (all other factors of importance being constant)
a) pulling up from a dive.
b) weight decreases.
c) minor altitude changes occur e.g. 0-10.000 ft.
d) spoilers are selected from OUT to IN.

81.1.8.2 (5384)
By what approximate percentage will the stall speed increase in a horizontal coordinated turn with a bank angle of 45° ?
a) 19%
b) 31%
c) 41%
d) 52%

81.1.8.2 (5385)
An aeroplane has a stalling speed of 100 kt in a steady level flight. When the aeroplane is flying a level turn with a load factor of 1.5, the stalling speed is:
a) 122 kt.
b) 141 kt.

c) 82 kt.
d) 150 kt.

81.1.8.2 (5386)
The stalling speed in IAS will change according to the following factors:
a) May increase with altitude, especially high altitude, will increase during icing conditions and will increase when the c.g. moves forward
b) May increase when the c.g. moves forward, with higher altitude and due to the slip stream from a propellor on an engine located forward of the wing
c) Will increase in a turn, higher temperature and will increase when the c.g. moves aft
d) Will increase with increased load factor, more flaps and increased bank angle in a turn

81.1.8.2 (5387)
The stalling speed in IAS will change according to the following factors:
a) Increase during turn, increased mass and forward c.g. location
b) Decrease in a forward c.g. location, higher altitude and due to the slip stream from a propeller on an engine located forward of the wing
c) Increase with increased load factor, icing conditions and an aft c.g. location
d) Increase with increased load factor, more flaps but will not increase due to the bank angle in a turn

81.1.8.2 (5388)
The stalling speed in IAS will change according to the following factors:
a) May increase during turbulence and will always increase when banking in a turn
b) Will increase during turn, increased mass and an aft c.g. location
c) Will decrease with a forward c.g. location, lower altitude and due to the slip stream from a propeller on an engine located forward of the wing
d) Will increase with increased load factor, icing conditions and more flaps

81.1.8.3 (5389)
A boundary layer fence on a swept wing will:
a) improve the low speed characteristics.
b) improve the high speed characteristics.
c) increase the critical Mach Number.
d) improve the lift coefficient of the trailing edge flap.

81.1.8.4 (5390)
Which of the following are used as stall warning devices?
a) Stick shaker and stallstrip .
b) Stick shaker and angle of attack indicator.
c) Angle of attack indicator and speed indicator.
d) Angle of attack sensor and stallstrip.

81.1.8.4 (5391)
The vane of a stall warning system with a flapper switch is activated by the change of the:
a) stagnation point.
b) centre of pressure.
c) centre of gravity.
d) point of lowest pressure.

81.1.8.4 (5392)
The normal stall recovery procedure for a light single engined aeroplane is:
a) full power and stick roll-neutral nose-down, correcting for angle of bank with rudder.
b) full power and stick roll-neutral nose-down, correction for angle of bank with stick.
c) idle power and stick roll-neutral nose-down and no other corrections.
d) idle power and stick neutral, waiting for the natural nose-down tendency.

81.1.8.4 (5393)
Compared with stalling airspeed (VS) in a given configuration, the airspeed at which stick shaker will be triggered is:
a) greater than VS.
b) 1.20 VS.
c) 1.30 VS.
d) 1.12 VS.

81.1.8.4 (5394)
The sensor of a stall warning system can be activated by a change in the location of the
a) stagnation point.
b) centre of lift.
c) transition region.
d) centre of gravity.

81.1.8.5 (5395)
On a swept wing aeroplane at low airspeed, the ""pitch up"" phenomenon:
a) is caused by wingtip stall.
b) never occurs, since a swept wing is a ""remedy"" to pitch up.
c) is caused by extension of trailing edge lift augmentation devices.
d) is caused by boundary layer fences mounted on the wings.

81.1.8.5 (5396)
Low speed pitch up is caused by the:
a) spanwise flow on a swept back wing.
b) spanwise flow on a swept forward wing.
c) wing tip vortex.
d) Mach trim system.

81.1.8.5 (5397)
The most important problem of ice accretion on an aeroplane during flight is:
a) reduction in CLmax.
b) increase in weight.
c) increase in drag.
d) blocking of control surfaces.

81.1.8.5 (5398)
The effects of very heavy rain (tropical rain) on the aerodynamic characteristics of an aeroplane are:
a) decrease of CLmax and increase of drag.
b) decrease of CLmax and decrease of drag.

c) increase of CLmax and increase of drag.
d) increase of CLmax and decrease of drag.

81.1.8.5 (5399)
Which of the following statements about stall speed is correct ?
a) Decreasing the angle of sweep of the wing will decrease the stall speed.
b) Increasing the angle of sweep of the wing will decrease the stall speed.
c) Use of a T-tail will decrease the stall speed..
d) Increasing the anhedral of the wing will decrease the stall speed.

81.1.8.5 (5400)
Which of the following statements about the spin is correct?
a) During spin recovery the ailerons should be kept in the neutral position.
b) An aeroplane is prone to spin when the stall starts at the wing root.
c) In the spin, airspeed continuously increases.
d) Every aeroplane should be designed such that it can never enter a spin.

81.1.8.5 (5401)
During an erect spin recovery:
a) the ailerons are held in the neutral position.
b) the control stick is moved side ways, against the angle of bank.
c) the control stick is moved side ways, in the direction of the angle of bank.
d) the control stick is pulled to the most aft position.

81.1.8.5 (5402)
Which combination of design features is known to be responsible for deep stall?
a) Swept back wings and a T-tail.
b) Straight wings and a T-tail.
c) Swept back wings and wing mounted engines.
d) Straight wings and aft fuselage mounted engines

81.1.8.5 (5403)
A strongly swept back wing stalls. If the wake of the wing contacts the horizontal tail, the effect on the stall behaviour can be:
a) nose up tendency and/or lack of elevator response.
b) nose down tendency.
c) increase sensitivity of elevator inputs.
d) tendency to increase speed after initial stall.

81.1.8.5 (5404)
The function of the stick pusher is:
a) to activate and push the stick forward at or beyond a certain value of angle of attack.
b) to activate and push the stick forward prior to stick shaker.
c) to vibrate the controls.
d) to pull the stick, to avoid a high speed stall.

81.1.8.5 (5405)
Stick pushers must be installed in aeroplanes with dangerous stall characteristics. Dangerous stall characteristics include:
a) Excessive wing drop and deep stall.
b) pitch down and yaw.
c) pitch down and minor wing drop.
d) pitch down and increase in speed.

81.1.8.5 (5406)
Which type of stall has the largest associated angle of attack?
a) Deep stall.
b) Shock stall.
c) Accelerated stall.
d) Low speed stall.

81.1.8.5 (5407)
Which aeroplane design has the highest probability of a super stall?
a) A T-tail.
b) A canard wing.
c) Swept wings.
d) A low horizontal tail.

81.1.8.5 (5408)
The pitch up effect of an aeroplane with swept wing in a stall is due to the
a) wing tip stalling first.
b) aft movement of the centre of gravity.
c) forward movement of the centre of gravity.
d) wing root stalling first.

81.1.8.5 (5409)
One disadvantage of the swept back wing is it's stalling characteristics. At the stall :
a) tip stall will occur first, which produces a pitch-up moment.
b) wing root stall will occur first, which produces a rolling moment
c) tip stall will occur first, which produces a nose-down moment
d) leading edge stall will occur first, which produces a nose-down moment

81.1.9.0 (5410)
Trailing edge flap extension will:
a) decrease the critical angle of attack and increase the value of CLmax.
b) increase the critical angle of attack and increase the value of CLmax.
c) decrease the critical angle of attack and decrease the value of CLmax.
d) increase the critical angle of attack and decrease the value of CLmax.

81.1.9.0 (5411)
Which of the following series of configurations has an increasing critical angle of attack ?
a) flaps only extended, clean wing, slats only extended.
b) clean wing, flaps only extended, slats only extended.
c) slats only extended, clean wing, flaps only extended.
d) slats only extended, flaps only extended, clean wing.

81.1.9.0 (5412)
An aeroplane with swept back wings is equipped with slats and/or leading edge (L.E.) flaps. One possible efficient way to arrange the leading edge devices on the wings is:
a) Wing roots: L.E. flapsWing tips: slats
b) Wing roots: slatsWing tips: L.E. flaps
c) Wing roots: slatsWing tips: no devices
d) Wing roots: L.E. flapsWing tips: no devices

81.1.9.0 (5413)
An aeroplane has the following flap settings : 0°, 15°, 30° and 45°. Slats can be selected too. Which of the above selections will produce the greatest negative influence on the CL/CD ratio?
a) Flaps from 30° to 45°.
b) The slats.
c) Flaps from 0° to 15°.
d) Flaps from 15° to 30°.

81.1.9.0 (5414)
After take-off the slats (when installed) are always retracted later than the flaps. Why ?
a) Because SLATS EXTENDED gives a large decrease in stall speed with relatively less drag.
b) Because SLATS EXTENDED provides a better view from the cockpit than FLAPS EXTENDED.
c) Because VMCA with SLATS EXTENDED is more favourable compared to the FLAPS EXTENDED situation.
d) Because FLAPS EXTENDED gives a large decrease in stall speed with relatively less drag.

81.1.9.0 (5415)
Which statement is correct?
a) Extension of flaps causes a reduction of the stall speed, the maximum glide distance also reduces.
b) Extension of flaps will increase (CL/CD)max, causing the minimum rate of descent to decrease.
c) Extension of flaps has no influence on the minimum rate of descent, as only the TAS has to be taken into account.
d) Spoiler extension decreases the stall speed and the minimum rate of descent, but increases the minimum descent angle.

81.1.9.1 (5416)
The trailing edge flaps when extended :
a) worsen the best angle of glide
b) increase the zero lift angle of attack
c) significantly increase the angle of attack for maximum lift
d) significantly lower the drag

81.1.9.1 (5417)
When the trailing edge flaps are deflected in level flight, the change in pitch moment will be:
a) nose down.
b) nose up.
c) zero.
d) dependent on c.g. location.

81.1.9.1 (5418)
Extension of FOWLER type trailing edge lift augmentation devices, will produce:
a) a nose-down pitching moment.
b) no pitching moment.
c) a nose-up pitching moment.
d) a force which reduces drag.

81.1.9.1 (5419)
On a wing fitted with a ""fowler"" type trailing edge flap, the ""Full extended"" position will produce:
a) an increase in wing area and camber.
b) an unaffected wing area and increase in camber.
c) an unaffected CD, at a given angle of attack.
d) an increase in wing area only.

81.1.9.1 (5420)
When flaps are extended in a straight and level flight at constant IAS, the lift coefficient will eventually :
a) remain the same.
b) increase.
c) decrease.
d) first increase and then decrease.

81.1.9.1 (5421)
When flaps are deployed at constant angle of attack the lift coefficient will:
a) increase.
b) decrease.
c) remain the same.
d) vary as the square of IAS.

81.1.9.1 (5422)
What is the most effective flap system?
a) Fowler flap.
b) Split flap.
c) Plain flap.
d) Single slotted flap.

81.1.9.1 (5423)
Deploying a Fowler flap, the flap will:
a) move aft, then turn down.
b) turn down, then move aft.
c) just move aft.
d) just turn down.

81.1.9.1 (5424)
A slotted flap will increase the CLmax by:
a) increasing the camber of the aerofoil and improving the boundary layer.

b) decreasing the skin friction.
c) increasing only the camber of the aerofoil.
d) increasing the critical angle of attack.

81.1.9.1 (5425)
In order to maintain straight and level flight at a constant airspeed, whilst the flaps are being retracted, the angle of attack will:
a) increase.
b) decrease.
c) remain constant.
d) increase or decrease depending on type of flap.

81.1.9.1 (5426)
Flap selection at constant IAS in straight and level flight will increase the :
a) maximum lift coefficient (CLmax) and the drag.
b) lift coefficient and the drag.
c) stall speed.
d) lift and the drag.

81.1.9.1 (5427)
During flap down selection in a continuous straight and level flight at constant IAS and weight:
a) the centre of pressure moves aft.
b) the lift coefficient and the drag coefficient increase.
c) the stall speed increases.
d) the total boundary layer becomes laminar.

81.1.9.1 (5428)
(For this question use annex 081-6269A)Which type of flap is shown in the picture?
a) Fowler flap
b) Double slotted flap
c) Plain flap
d) Split flap

81.1.9.1 (5429)
(For this question use annex 081-6270A)Which type of flap is shown in the picture?
a) Split flap
b) Single slotted flap
c) Fowler flap
d) Plain flap

81.1.9.1 (5430)
A plain flap will increase CLmax by
a) increasing the camber of the aerofoil.
b) increasing angle of attack.
c) boundary layer control.
d) centre of lift movement.

81.1.9.1 (5431)
During the retraction of the flaps at a constant angle of attack the aeroplane starts to (all other factors of importance being constant)
a) sink suddenly.
b) bank.
c) climb.
d) yaw.

81.1.9.1 (5432)
During the extension of the flaps at a constant angle of attack the aeroplane starts to (all other factors of importance being constant)
a) climb.
b) bank.
c) sink suddenly.
d) yaw.

81.1.9.1 (5433)
Compared with the flap up configuration the maximum angle of attack for the flaps down configuration is
a) smaller.
b) larger.
c) unchanged.
d) smaller or larger depending on flap deflection.

81.1.9.2 (5434)
Deflection of leading edge flaps will:
a) increase critical angle of attack.
b) decrease CLmax.
c) decrease drag.
d) not affect critical angle of attack.

81.1.9.2 (5435)
Slat extension will:
a) increase critical angle of attack.
b) reduce tip vortices.
c) create gaps between leading edge and engine nacelles.
d) decrease the energy in the boundary layer on the upperside of the wing.

81.1.9.2 (5436)
Which of the following statements about the difference between Krueger flaps and slats is correct?
a) Deploying a slat will form a slot, deploying a Krueger flap does not.
b) Deploying a Krueger flap will form a slot, deploying a slat does not.
c) Deploying a slat will increase critical angle of attack, deploying a Krueger flap does not.
d) Deploying a Krueger flap will increase critical angle of attack, deploying a slat does not.

81.1.9.2 (5437)
What is the purpose of an auto-slat system ?
a) extend automatically when a certain value of angle of atttack is exceeded.
b) provide automatically slat IN selection after take-off.
c) ensures that the slats are always extended when the ground/flight system is in the

""ground"" position.
d) assist the ailerons during rolling.

81.1.9.2 (5438)
The function of the slot between an extended slat and the leading edge of the wing is to:
a) cause a venturi effect which energizes the boundary layer.
b) allow space for vibration of the slat.
c) reduce the wing loading.
d) slow the air flow in the slot so that more pressure is created under the wing.

81.1.9.2 (5439)
A deployed slat will:
a) increase the boundary layer energy, move the suction peak from the fixed part of the wing to the slat, so that the stall is postponed to higher angles of attack.
b) increase the boundary layer energy and increase the suction peak on the fixed part of the wing, so that the stall is postponed to higher angles of attack.
c) decrease the boundary layer energy and decrease the suction peak on the slat, so that CLmax is reached at lower angles of attack.
d) increase the camber of the aerofoil and increase the effective angle of attack, so that CLmax is reached at higher angles of attack.

81.1.9.2 (5440)
What increases the stalling angle of attack ? Use of :
a) slats
b) flaps
c) spoilers
d) fuselage mounted speed-brakes

81.1.9.2 (5441)
The use of a slot in the leading edge of the wing enables the aeroplane to fly at a slower speed because :
a) it delays the stall to a higher angle of attack
b) the laminar part of the boundary layer gets thicker
c) it decelerates the upper surface boundary layer air
d) it changes the camber of the wing

81.1.9.2 (5442)
(For this question use annex 081-6271A)The high lift device shown in the figure is a
a) Slat
b) Fowler flap
c) Slotted flap
d) Krueger flap

81.1.9.2 (5443)
(For this question use annex 081-6272A)The high lift device shown in the figure below is a
a) Krueger flap
b) Fowler flap
c) Slotted flap
d) Slot or slat

81.1.9.2 (5444)
A slat will
a) increase the boundary layer energy and prolongs the stall to a higher angle of attack.
b) increase the camber of the aerofoil and divert the flow around the sharp leading edge.
c) increase the lift by increasing the wing area and the camber of the aft portion of the wing.
d) provide a boundary layer suction on the upper side of the wing.

81.1.9.3 (5445)
Vortex generators:
a) transfer energy from the free airflow into the boundary layer.
b) change the turbulent boundary layer into a laminar boundary layer.
c) reduce the spanwise flow on swept wing.
d) take kinetic energy out of the boundary layer to reduce separation.

81.1.10.1 (5446)
Spoiler deflection causes :
a) an increase in drag and decrease in lift
b) an increase in lift and drag
c) an increase in lift only
d) decrease in lift and drag

81.1.10.1 (5447)
Upon extension of a spoiler on a wing:
a) CD is increased and CL is decreased.
b) only CL is decreased (CD remains unaffected).
c) both CL and CD are increased.
d) CD is increased, while CL remains unaffected.

81.1.10.1 (5448)
When ""spoilers"" are used as speed brakes:
a) at same angle of attack, CD is increased and CL is decreased.
b) CLmax of the polar curve is not affected.
c) they do not affect wheel braking action during landing.
d) at same angle of attack, CL remains unaffected.

81.1.11.1 (5449)
There are two types of boundary layer: laminar and turbulent. One important advantage the turbulent boundary layer has over the laminar type is that :
a) it has less tendency to separate from the surface
b) it is thinner
c) skin friction drag is less
d) energy is less

81.1.12.1 (5450)
In which phase of the take-off is the aerodynamic effect of ice located on the wing leading edge most critical?

a) The last part of the rotation.
b) The take-off run.
c) During climb with all engines operating.
d) All phases of the take-off are equally critical.

81.2.1.0 (5451)
The formula for the Mach Number is:(a= speed of sound)
a) M= TAS / a
b) M= a / TAS
c) M= TAS*a
d) M= IAS / a

81.2.1.0 (5452)
The Mach number:
a) is the ratio between the TAS of the aeroplane and the local speed of sound.
b) is the ratio between the TAS of the aeroplane and the speed of sound at sea level.
c) is the ratio between the IAS of the aeroplane and the local speed of sound.
d) increases at a given TAS, when the temperature rises.

81.2.1.1 (5453)
Climbing at a constant Mach Number up to FL 350 the TAS will:
a) decrease.
b) first increase, then decrease.
c) increase.
d) remain constant.

81.2.1.1 (5454)
The flight Mach number is 0.8 and the TAS is 400 kts. The speed of sound is:
a) 500 kts
b) 320 kts
c) 480 kts
d) 600 kts

81.2.1.1 (5455)
Which statement with respect to the speed of sound is correct ?
a) Varies with the square root of the absolute temperature.
b) Increases always if the density of the air decreases.
c) Is independent of altitude.
d) Doubles if the temperature increases from 9° to 36° Centigrade.

81.2.1.2 (5456)
If the altitude is increased and the TAS remains constant in the standard troposphere the Mach Number will:
a) increase.
b) decrease.
c) not change.
d) increase or decrease, depends of the type of aeroplane.

81.2.1.2 (5457)
The speed of sound is affected by the:
a) temperature of the air.
b) density of the air.
c) pressure of the air.
d) humidity of the air.

81.2.1.2 (5458)
An aeroplane is descending at a constant Mach number from FL 350. What is the effect on true airspeed ?
a) It increases as temperature increases
b) It decreases as pressure increases
c) It decreases as altitude decreases
d) It remains constant

81.2.1.3 (5459)
To be able to predict compressibility effects you have to determine the:
a) Mach Number.
b) EAS.
c) TAS.
d) IAS.

81.2.2.0 (5460)
A normal shock wave:
a) can occur at different points on the aeroplane in transonic flight.
b) is a discontinuity plane in an airflow, in which the temperature drops suddenly.
c) is a discontinuity plane in an airflow, in which the pressure drops suddenly.
d) is a discontinuity plane in an airflow, which is always normal to the surface.

81.2.2.0 (5461)
Which statement is correct about a normal shock wave ?
a) The airflow changes from supersonic to subsonic
b) The airflow changes direction
c) The airflow changes from subsonic to supersonic
d) The airflow expands when passing the aerofoil

81.2.2.0 (5462)
Compared with an oblique shock wave at the same Mach number a normal shock wave has a
a) higher compression.
b) higher expansion.
c) smaller compression.
d) smaller expansion.

81.2.2.0 (5463)
Compared with an oblique shock wave at the same Mach number a normal shock wave has a
a) higher loss in total pressure.
b) higher total pressure.
c) higher total temperature.
d) lower static temperature.

81.2.2.0 (5464)
The regime of flight from the critical Mach number up to M = 1.3 is called the
a) transonic range.
b) supersonic range.
c) hypersonic range.
d) subsonic range.

81.2.2.1 (5465)
Mcrit is the free stream Mach Number at which:
a) somewhere about the airframe Mach 1 is reached locally.
b) Mach buffet occurs.
c) shockstall occurs.
d) the critical angle of attack is reached.

81.2.2.1 (5466)
When the Mach number is slowly increased in straight and level flight the first shockwaves will occur:
a) at the wing root segment, upperside.
b) on the underside of the wing.
c) somewhere on the fin.
d) somewhere on the hoizontal tail.

81.2.2.1 (5467)
The critical Mach Number of an aeroplane is the free stream Mach Number, which produces the first evidence of :
a) local sonic flow.
b) buffet.
c) shock wave.
d) supersonic flow.

81.2.2.1 (5468)
Air passes a normal shock wave. Which of the following statements is correct?
a) The temperature increases.
b) The pressure decreases.
c) The temperature decreases.
d) The velocity increases.

81.2.2.1 (5469)
The critical Mach number for an aerofoil equals the free stream airfoil Mach number at which:
a) sonic speed (M=1) is reached at a certain point on the upper side of the aerofoil.
b) the maximum operating temperature is reached.
c) a shock-wave appears on the upper surface.
d) a ""supersonic bell"" appears on the upper surface.

81.2.2.1 (5470)
When the air has passed through a normal shock wave the Mach number is
a) less than 1.
b) lower than before but still greater than 1.
c) equal to 1.
d) higher than before.

81.2.2.1 (5471)
When the air is passing through a shock wave the static temperature will
a) increase.
b) decrease.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again

81.2.2.1 (5472)
When the air is passing through a shock wave the density will
a) increase.
b) decrease.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again

81.2.2.1 (5473)
When air has passed through a shock wave the speed of sound is
a) increased.
b) not affected
c) decreased.
d) decreased and beyond a certain Mach number start increasing again

81.2.2.1 (5474)
Just above the critical Mach number the first evidence of a shock wave will appear at the
a) upper side of the wing.
b) lower side of the wing.
c) leading edge of the wing.
d) trailing edge of the wing.

81.2.2.1 (5475)
Critical Mach-number is the :
a) highest speed without supersonic flow over any part of the aeroplane.
b) speed at which there is subsonic airflow over all parts of the aircraaeroplane Mach number < 1).
c) speed at which there is supersonic airflow over all parts of the aeroplane.
d) highest speed at which the aeroplane is certificated for operation (MMO).

81.2.2.1 (5476)
The loss of total pressure in a shock wave is due to the fact that
a) kinetic energy in the flow is changed into heat energy.
b) the speed reduction is too high.
c) the static pressure decrease is comparatively high.
d) the friction in the boundary layer is higher.

81.2.2.2 (5477)
Which of the following (1) aerofoils and (2) angles of attack will produce the lowest Mcrit values?
a) (1) thick and (2) large.
b) (1) thick and (2) small.
c) (1) thin and (2) large.
d) (1) thin and (2) small.

81.2.2.2 (5478)
In the transonic range the aeroplane characteristics are strongly determined by:
a) the Mach Number.
b) the TAS.
c) the IAS.
d) the CAS.

81.2.2.2 (5479)
Which of the following flight phenomena can happen at Mach Numbers below the critical Mach Number?
a) Dutch roll.
b) Tuck under.
c) Mach buffet.
d) Shock stall.

81.2.2.2 (5480)
The critical Mach Number of an aeroplane can be increased by:
a) sweep back of the wings.
b) vortex generators.
c) control deflection
d) dihedral of the wings.

81.2.2.2 (5481)
In transonic flight the ailerons will be less effective than in subsonic flight because:
a) aileron deflection only partly affects the pressure distribution around the wing.
b) behind the shock wave pressure is lower.
c) aileron down deflection moves the shock wave forward.
d) aileron deflection only affects the air in front of the shock wave.

81.2.2.2 (5482)
Two methods to increase the critical Mach Number are:
a) thin aerofoils and sweep back of the wing.
b) thin aerofoils and dihedral of the wing.
c) positive cambering of the aerofoil and sweep back of the wing.
d) thick aerofoils and dihedral of the wing.

81.2.2.2 (5483)
If an aeroplane is flying at transonic speed with increasing Mach number the shock wave on the upper side of the wing
a) moves into trailing edge direction.
b) moves into leading edge direction.
c) stays all the time at the same position.
d) disappears.

81.2.2.2 (5484)
To increase the critical Mach number a conventional aerofoil should
a) have a low thickness to chord ratio.
b) have a large camber.
c) be used with a high angle of attack.
d) have a large leading edge radius.

81.2.2.2 (5485)
The critical Mach number can be increased by
a) sweepback of the wings.
b) positive dihedral of the wings.
c) a T-tail.
d) an increase in wing aspect ratio.

81.2.2.2 (5486)
Some aeroplanes have a 'waist' or 'coke bottle' contoured fuselage. This is done to
a) apply area rule.
b) increase the strength of the wing root junction.
c) fit the engine intakes better to the fuselage.
d) improve the low speed characteristics.

81.2.2.2 (5487)
The application of the area rule on aeroplane design will decrease the
a) wave drag.
b) skin friction drag.
c) induced drag.
d) form drag.

81.2.2.2 (5488)
When comparing a rectangular wing and a swept back wing of the same wing area and wing loading, the swept back wing has the advantage of :
a) Higher critical Mach number
b) Greater strength
c) Increased longitudinal stability
d) Lower stalling speed

81.2.2.2 (5489)
What is the influence of decreasing aeroplane weight on Mcrit at constant IAS ?
a) Mcrit increases as a result of flying at a smaller angle of attack.
b) Mcrit increases as a result of compressibility effects.
c) Mcrit decreases.
d) Mcrit decreases as a result of flying at a greater angle of attack.

81.2.2.2 (5490)
What is the effect of a decreasing aeroplane weight on Mcrit at n=1, when flying at constant IAS ? The value of Mcrit:
a) increases.
b) remains constant.
c) is independent of the angle of attack.
d) decreases.

81.2.2.3 (5491)
How does stalling speed (IAS) vary with altitude?
a) It remains constant at lower altitudes but increases at higher altitudes due to compressibility effects.
b) It remains constant.
c) It increases with increasing altitude, because the density decreases.

d) It remains constant at lower altitudes but decreases at higher altitudes due to compressibility effects.

81.2.2.3 (5492)
Which kind of flow separation occurs at the smallest angle of attack?
a) shockstall.
b) high-speed stall.
c) low-speed stall.
d) deep stall.

81.2.2.3 (5493)
At higher altitudes, the stall speed (IAS):
a) increases
b) decreases
c) remains the same
d) decreases until the tropopause

81.2.2.5 (5494)
Shock stall is:
a) separation of the boundary layer behind the shock wave.
b) separation of the flow behind the bow wave.
c) separation of the flow at high angles of attack and at high Mach Numbers.
d) separation of the flow at the trailing edge of the wing at high Mach Numbers.

81.2.2.5 (5495)
Which of the following flight phenomena can only happen at Mach Numbers above the critical Mach Number?
a) Mach buffet.
b) Dutch roll.
c) Speed instability.
d) Elevator stall.

81.2.2.5 (5496)
Shock induced separation results in
a) decreasing lift.
b) constant lift.
c) increasing lift.
d) decreasing drag.

81.2.2.5 (5497)
In the transonic range lift will decrease at the shock stall due to the
a) separation of the boundary layer at the shock waves.
b) attachment of the shock wave on the trailing edge of the wing.
c) first appearance of a shock wave at the upper side of the wing.
d) appearance of the bow wave.

81.2.2.5 (5498)
The high speed buffet is induced by
a) boundary layer separation due to shock waves.
b) boundary layer control.
c) expansion waves on the wing upper side.
d) a shift of the centre of gravity.

81.2.2.6 (5499)
""Tuck under"" is caused by (i) which movement of the centre of pressure of the wing and (ii) which change of the downwash angle at the location of the stabilizer.
a) (i) aft (ii) decreasing
b) (i) forward (ii) decreasing
c) (i) aft (ii) increasing
d) (i) forward (ii) increasing

81.2.2.6 (5500)
The consequences of exceeding Mcrit in a swept-wing aeroplane may be : (assume no corrective devices, straight and level flight)
a) buffeting of the aeroplane and a tendency to pitch down.
b) an increase in speed and a tendency to pitch up.
c) engine unbalance and buffeting.
d) buffeting of the aeroplane and a tendency to pitch up.

81.2.2.6 (5501)
The Mach trim system will:
a) adjust the stabilizer, depending on the Mach Number.
b) keep the Mach Number automatically constant.
c) pump the fuel from tank to tank, depending on the Mach Number.
d) adjust the elevator trim tab, depending on the Mach Number.

81.2.2.6 (5502)
The Mach trim system will prevent:
a) tuck under.
b) dutch roll.
c) buffeting.
d) shock stall.

81.2.2.6 (5503)
When an aeroplane is flying through the transonic range with increasing Mach Number the centre of the pressure of the wing will move aft. This requires:
a) a pitch up input of the stabilizer.
b) a stability augmentation system.
c) much more thrust from the engine.
d) a higher IAS to compensate the nose down effect.

81.2.2.6 (5504)
Tuck under will happen
a) only above the critical Mach number.
b) only at the critical Mach number.
c) only below the critical Mach number.
d) above or below the critical Mach number depending on the angle of attack.

81.2.2.6 (5505)
The Mach-trim function is installed on most commercial jets in order to minimize

the adverse effects of :
a) changes in the position of centre of pressure
b) increased drag due to shock wave formation
c) uncontrolled changes in stabilizer setting
d) compressibility effects on the stabilizer

81.2.2.7 (5506)
(For this question use annex 081-1331A)An A 310 aeroplane weighing 100 tons is turning at FL 350 at constant altitude with a bank of 50 degrees. Its flight Mach range between low-speed buffeting and high-speed buffeting goes from:
a) M= 0.69 to M higher than 0.84
b) M= 0.72 to M higher than 0.84
c) M= 0.65 to M higher than 0.84
d) M= 0.74 to M= 0.84

81.2.2.7 (5507)
What data may be obtained from the Buffet Onset Boundary chart?
a) The values of the Mach Number at which low speed and Mach Buffet occur at different weights and altitudes.
b) The values of MMO at different weights and altitudes.
c) The values of Mcrit at different weights and altitudes.
d) The values of the Mach Number at which low speed and shock-stall occur at different weights and altitudes.

81.2.2.7 (5508)
The maximum acceptable cruising altitude is limited by a minimum acceptable loadfactor because exceeding that altitude:
a) turbulence may induce Mach buffet.
b) turbulence may exceed the limit load factor.
c) a sudden necessary bankangle may exceed the limit load factor.
d) Mach buffet will occur immediately.

81.2.2.7 (5509)
Should a transport aeroplane fly at a higher Mach number than the 'buffet-onset' Mach number?
a) No, this is not acceptable
b) Yes, this causes no problems.
c) Yes, but only during approach.
d) Yes, if you want to fly fast at very high altitudes.

81.2.2.7 (5510)
A jet aeroplane is cruising at high altitude with a Mach-number, that provides a buffet margin of 0.3g incremental. In order to increase the buffet margin to 0.4g incremental the pilot must :
a) fly at a lower altitude and the same Mach-number
b) extend the flaps to the first selection
c) fly at a higher Mach-number
d) fly at a larger angle of attack

81.2.2.7 (5511)
The buffet margin :
a) increases during a descent with a constant IAS.
b) is always greatest after a stepclimb has been executed.
c) decreases during a descent with a constant Mach number.
d) is always positive at Mach numbers below MMO.

81.2.3.1 (5512)
Vortex generators on the upper side of the wing surface will:
a) decrease the intensity of shock wave induced air separation.
b) increase the critical Mach Number.
c) decrease the span wise flow at high Mach Numbers.
d) increase the magnitude of the shock wave.

81.2.3.1 (5513)
Vortex generators on the upper side of the wing:
a) decrease wave drag.
b) increase wave drag.
c) increase critical Mach Number.
d) decrease critical Mach Number.

81.2.3.1 (5514)
Vortex generators mounted on the upper wing surface will
a) decrease the shock wave induced separation.
b) decrease the interference drag of the trailing edge flaps.
c) decrease the stalling speed by increase of the tangential velocity of the swept wing.
d) increase the effectiveness of the spoiler due to increase in parasite drag.

81.3.1.0 (5515)
How will the density and temperature change in a supersonic flow from a position in front of a shock wave to behind it ?
a) Density will increase, temperature will increase.
b) Density will increase, temperature will decrease.
c) Density will decrease, temperature will increase.
d) Density will decrease, temperature will decrease.

81.3.1.0 (5516)
At what speed does the front of a shock wave move across the earth's surface?
a) The ground speed of the aeroplane.
b) The speed of sound at ground level.
c) The speed of sound at flight level.
d) The true air speed of the aeroplane.

81.3.1.1 (5517)
In supersonic flight, all disturbances produced by an aeroplane are:
a) in between a conical area, depending on the Mach Number.
b) outside the conical area depending on the Mach Number.
c) in front of the aeroplane.
d) very weak and negligible.

81.3.1.1 (5518)
The bow wave will appear first at:

a) M= 1.0
b) M= Mcrit
c) M= 0.6
d) M= 1.3

81.3.1.1 (5519)
If the Mach number of an aeroplane in supersonic flight is increased, the shock wave angles will
a) decrease.
b) increase.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again.

81.3.1.3 (5520)
When air has passed an expansion wave, the static pressure is:
a) decreased.
b) decreased or increased, depending on Mach Number.
c) increased.
d) unchanged.

81.3.1.3 (5521)
When the air is passing through an expansion wave the local speed of sound will
a) decrease.
b) increase.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again.

81.3.1.3 (5522)
When the air is passing through an expansion wave the Mach number will
a) increase.
b) decrease.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again.

81.3.1.3 (5523)
When the air is passing through an expansion wave the static temperature will
a) decrease.
b) increase.
c) stay constant.
d) decrease and beyond a certain Mach number start increasing again.

81.3.1.3 (5524)
In case of supersonic flow retarded by a normal shock wave a high efficiency (low loss in total pressure) can be obtained if the Mach number in front of the shock is
a) small but still supersonic.
b) high (supersonic).
c) lower than 1.
d) exactly 1.

81.3.1.3 (5525)
Which statement is correct about an expansion wave in a supersonic flow ?1- The density in front of an expansion wave is higher than behind.2- The pressure in front of an expansion wave is higher than behind.
a) 1 and 2 are correct.
b) 1 is correct and 2 is incorrect.
c) 1 is incorrect and 2 is correct.
d) 1 and 2 are incorrect.

81.3.1.3 (5526)
Which statement is correct about an expansion wave in supersonic flow ?1. The temperature in front of an expansion wave is higher than the temperature behind it.2. The speed in front of an expansion wave is higher than the speed behind it.
a) 1 is correct and 2 is incorrect.
b) 1 and 2 are correct.
c) 1 is incorrect and 2 is correct.
d) 1 and 2 are incorrect.

81.3.1.4 (5527)
On a non swept wing, when the aerofoil is accelerated from subsonic to supersonic speeds, the aerodynamic centre :
a) shifts from 25% to about 50% of the aerofoil chord.
b) shifts aft by about 10%.
c) remains unchanged.
d) slightly shifts forward.

81.3.1.4 (5528)
If an aeroplane is accelerated from subsonic to supersonic speeds, the centre of pressure will move:
a) to the mid chord position.
b) forward.
c) to a position near the leading edge.
d) to a position near the trailing edge.

81.3.1.4 (5529)
The aft movement of the centre of pressure during the acceleration through the transonic flight regime will:
a) increase the static longitudinal stability.
b) decrease the longitudinal stability.
c) increase the static lateral stability.
d) decrease the static lateral stability.

81.3.1.4 (5530)
In supersonic flight aerofoil pressure distribution is:
a) rectangular.
b) irregular.
c) triangular.
d) the same as in subsonic flight.

81.3.1.4 (5531)
If a symmetrical aerofoil is accelerated from subsonic to supersonic speed the

centre of lift will move
<u>a) aft to the mid chord.</u>
b) aft to the trailing edge.
c) forward to the leading edge.
d) forward to the mid chord.

81.3.1.5 (5532)
The additional increase of drag at Mach Numbers above the critical Mach Number is due to:
<u>a) wave drag.</u>
b) increased angle of attack.
c) increased interference drag.
d) increased skin friction.

81.4.1.1 (5533)
If the total sum of moments about one of its axis is not zero, an aeroplane:
<u>a) would experience an angular acceleration about that axis.</u>
b) would be difficult to control.
c) would fly a path with a constant curvature.
d) would not be affected because the situation is normal.

81.4.1.2 (5534)
In which situation would the wing lift of an aeroplane in straight and level flight have the highest value ?
<u>a) Forward centre of gravity and idle thrust.</u>
b) Aft centre of gravity and idle thrust.
c) Forward centre of gravity and take-off thrust.
d) Aft centre of gravity and take-off thrust.

81.4.1.2 (5535)
If the sum of moments in flight is not zero, the aeroplane will rotate about:
<u>a) the centre of gravity.</u>
b) the neutral point of the aeroplane.
c) the aerodynamic centre of the wing.
d) the centre of pressure of the wing.

81.4.2.1 (5536)
When an aeroplane with the centre of gravity forward of the centre of pressure of the combined wing / fuselage is in straight and level flight, the vertical load on the tailplane will be:
<u>a) downwards.</u>
b) upwards.
c) zero because in steady flight all loads are in equilibrium.
d) downwards because it is always negative regardless of the position of the centre of gravity.

81.4.2.1 (5537)
An aeroplane, with a C.G. location behind the centre of pressure of the wing can only maintain a straight and level flight when the horizontal tail loading is:
<u>a) upwards.</u>
b) zero.
c) downwards.
d) upwards or downwards depending on elevator deflection.

81.4.2.2 (5538)
In a twin-engined jet powered aeroplane (engines mounted below the low wings) the thrust is suddenly increased. Which elevator deflection will be required to maintain the pitching moment zero ?
<u>a) Down.</u>
b) Up.
c) No elevator movement will required because the thrust line of the engines remains unchanged.
d) It depends on the position of the centre of gravity.

81.4.3.1 (5539)
Which of the following statements is correct?
<u>a) Dynamic stability is possible only when the aeroplane is statically stable about the relevant axis.</u>
b) Static stability means that the aeroplane is also dynamically satble about the relevant axis.
c) Dynamic stability means that after being displaced from original equilibrium condition, the aeroplane will return to that condition without oscillation.
d) A dynamically stable aeroplane would be almost impossible to fly manually.

81.4.3.1 (5540)
Positive static stability of an aeroplane means that once it has been displaced the :
<u>a) initial tendency to move is towards its equilibrium position.</u>
b) initial tendency to move is away from its equilibrium position.
c) tendency will be to move with an oscillating motion of decreasing amplitude.
d) tendency will be to move with an oscillating motion of increasing amplitude.

81.4.3.1 (5541)
After a disturbance about the lateral axis, an aeroplane oscillates about the lateral axis at a constant amplitude. The aeroplane is:
<u>a) Statically stable - Dynamically neutral</u>
b) Statically unstable - Dynamically stable
c) Statically stable - Dynamically unstable
d) Statically unstable - Dynamically neutral

81.4.3.1 (5542)
Which one of the following statements about the dynamic stability of a conventional aeroplane about the lateral axis is correct?
<u>a) Damping of the phugoid is normally very weak.</u>
b) Speed remains constant during one period of the phugoid.
c) Period time of the phugoid is normally 5 sec.
d) An aft C.G. position shortens the period time of the phugoid.

81.4.3.1 (5543)
The ""short period mode"" is an:
<u>a) oscillation about the lateral axis.</u>
b) oscillation about the vertical axis.
c) oscillation about the longitudinal axis.
d) unstable movement of the aeroplane, induced by the pilot.

81.4.3.1 (5544)
An aeroplane that has positive static stability:
a) can be dynamically stable, neutral or unstable.
b) is always dynamically stable.
c) is never dynamically stable.
d) is always dynamically unstable.

81.4.3.1 (5545)
A statically unstable aeroplane is:
a) never dynamically stable.
b) always dynamically stable.
c) sometimes dynamically stable.
d) sometimes dynamically unstable.

81.4.3.1 (5546)
One of the requirements for dynamic stability is:
a) positive static stability.
b) a large deflection range of the stabilizer trim.
c) a small C.G. range.
d) effective elevator.

81.4.3.2 (5547)
The manoeuvrability of an aeroplane is best when the:
a) C.G. is on the aft C.G. limit.
b) speed is low.
c) C.G. position is on the forward C.G. limit.
d) flaps are down.

81.4.3.3 (5548)
Longitudinal static stability is created by the fact that the:
a) centre of gravity is located in front of the neutral point of the aeroplane.
b) centre of gravity is located in front of the leading edge of the wing.
c) wing surface is greater than the horizontal tail surface.
d) aeroplane possesses a large trim speed range.

81.4.3.4 (5549)
The aerodynamic centre of the wing is the point, where:
a) pitching moment coefficient does not vary with angle of attack.
b) change of lift due to variation of angle of attack is constant.
c) aerodynamic forces are constant.
d) the aeroplane's lateral axis intersects with the centre of gravity.

81.4.3.5 (5550)
For a normal stable aeroplane, the centre of gravity is located:
a) with a sufficient minimum margin ahead of the neutral point of the aeroplane.
b) aft of the neutral point of the aeroplane.
c) at the neutral point of the aeroplane.
d) between the aft limit and the neutral point of the aeroplane.

81.4.3.5 (5551)
The max aft position of the centre of gravity is amongst others limited by the:
a) minimum value of the stick force per g.
b) maximum longitudinal stability of the aeroplane.
c) maximum elevator deflection.
d) too small effect of the controls on the aeroplane.

81.4.3.5 (5552)
A C.G location beyond the aft limit leads to:
a) an unacceptable low value of the manoeuvre stability (stick force per g, Fe/g).
b) a too high pulling stick force during rotation in the take off.
c) an increasing static longitudinal stability.
d) a better recovery performance in the spin.

81.4.3.7 (5553)
In what way is the longitudinal stability affected by the degree of positive camber of the aerofoil?
a) No effect, because camber of the aerofoil produces a constant pitch down moment coefficient, independent of angle of attack.
b) Positive, because the centre of pressure shifts rearward at increasing angle of attack.
c) Negative, because the lift vector rotates forward at increasing angle of attack.
d) Positive, because the lift vector rotates backward at increasing angle of attack.

81.4.3.7 (5554)
Which part of an aeroplane provides the greatest positive contribution to the static longitudinal stability ?
a) The horizontal tailplane.
b) The engine.
c) The fuselage.
d) The wing.

81.4.3.9 (5555)
During landing of a low-winged jet aeroplane, the maximum elevator up deflection is normally required when the flaps are:
a) fully down and the C.G. is fully forward.
b) up and the C.G. is fully forward.
c) fully down and the C.G. is fully aft.
d) up and the C.G. is fully aft.

81.4.3.11 (5556)
The C.G. position of an aeroplane is forward of the neutral point in a fixed location. Speed changes cause a departure from the trimmed position. Which of the following statements about the stick force stability is correct?
a) Increasing 10 kt trimmed at low speed has more effect on the stick force than increasing 10 kt trimmed at high speed.
b) Increase of speed generates pull forces.
c) Aeroplane nose up trim decreases the stick force stability.
d) Stick force stability is not affected by trim.

81.4.3.11 (5557)
""Tuck under"" is:

a) the tendency to nose down when speed is increased into the transonic flight regime.
b) the tendency to nose up when speed is increased into the transonic flight regime.
c) shaking of the control column at high Mach Number.
d) the tendency to nose down when the control column is pulled back.

81.4.3.11 (5558)
""Tuck under"" may happen at:
a) high Mach numbers.
b) low Mach numbers.
c) all Mach numbers.
d) only at low altitudes.

81.4.3.11 (5559)
Which of the following statements about a Mach trimmer is correct?
a) A Mach trimmer corrects the change in stick force stability of a swept wing aeroplane above a certain Mach number.
b) A straight wing aeroplane always needs a Mach trimmer for flying at Mach numbers close to MMO.
c) A Mach trimmer reduces the stick force stability of a straight wing aeroplane to zero at high Mach numbers.
d) The Mach trimmer corrects the natural tendency of a swept wing aeroplane to pitch-up.

81.4.3.11 (5560)
In case the Mach trimmer fails:
a) the Mach number must be limited.
b) try to relocate the centre-of-gravity aft.
c) the speed must be kept constant.
d) the aeroplane weight must be limited.

81.4.3.11 (5561)
A Machtrimmer:
a) corrects insufficient stick force stability at high Mach Numbers.
b) increases the stick force per g at high Mach Numbers.
c) is necessary for compensation of the autopilot at high Mach Numbers.
d) has no effect on the shape of the elevator position versus speed (IAS) curve for a fully hydraulic controlled aeroplane.

81.4.3.14 (5562)
The (1) stick force stability and the (2) manoeuvre stability are positively affected by:
a) (1) forward C.G. position (2) forward CG. position.
b) (1) forward C.G. position (2) aeroplane nose up trim.
c) (1) aft C.G. position (2) aft CG. position.
d) (1) aeroplane nose up trim (2) aeroplane nose up trim.

81.4.3.14 (5563)
Which statement about stick force per g is correct?
a) The stick force per g must have both an upper and lower limit in order to assure acceptable control characteristics.
b) The stick force per g increases, when centre of gravity is moved aft.
c) The stick force per g can only be corrected by means of electronic devices (stability augmentation) in case of an unacceptable value.
d) If the slope of the Fe-n line becomes negative, generally speaking this is not a problem for control of an aeroplane.

81.4.3.15 (5564)
The value of the manoeuvre stability of an aeroplane is 150 N/g. The load factor in straight and level flight is 1. The increase of stick force necessary to achieve the load factor of 2.5 is:
a) 225 N.
b) 375 N.
c) 450 N.
d) 150 N.

81.4.4.2 (5565)
An aeroplane has static directional stability, in a side-slip to the right, initially the:
a) nose of the aeroplane tends to move to the right.
b) right wing tends to go down.
c) nose of the aeroplane will remain in the same direction.
d) nose of the aeroplane tends to move to the left.

81.4.4.4 (5566)
The effect of a positive wing sweep on static directional stability is as follows:
a) Stabilizing effect
b) No effect
c) Destabilizing dihedral effect
d) Negative dihedral effect

81.4.5.5 (5567)
The effect of a high wing with zero dihedral is as follows:
a) Positive dihedral effect
b) Negative dihedral effect
c) Its only purpose is to ease aeroplane loading
d) Zero dihedral effect

81.4.5.5 (5568)
Which of the following lists aeroplane features that each increase static lateral stability ?
a) High wing, sweep back, large and high vertical fin.
b) Low wing, dihedral, elliptical wing planform.
c) Fuselage mounted engines, dihedral, T-tail.
d) Sweep back, under wing mounted engines, winglets.

81.4.5.5 (5569)
Which type of wing arrangement decreases the static lateral stability of an aeroplane?
a) Anhedral.
b) Dihedral.
c) High wing.
d) Increased wing span.

81.4.5.5 (5570)
The effect of a ventral fin on the static stability of an aeroplane is as follows : (1=longitudinal, 2=lateral, 3=directional)
a) 1 : no effect, 2 : negative, 3 : positive
b) 1 : positive, 2 : negative, 3 : negative
c) 1 : negative, 2 : positive, 3 : positive
d) 1 : no effect, 2 : positive, 3: negative

81.4.5.5 (5571)
Dihedral of the wing:
a) increases the static lateral stability.
b) is the only way to increase the static lateral stability.
c) is only positive for aeroplanes with high mounted wings.
d) decreases the static lateral stability.

81.4.5.5 (5572)
Which statement is correct for a side slip condition at constant speed and side slip angle, where the geometric dihedral of an aeroplane is increased ?
a) the required lateral control force increases.
b) the required lateral control force decreases.
c) the required lateral control force does not change.
d) the stick force per g decreases.

81.4.5.6 (5573)
Which of the following statements about dihedral is correct?
a) The ""effective dihedral"" of an aeroplane component means the contribution of that component to the static lateral stability.
b) Effective dihedral is the angle between the 1/4-chord line and the lateral axis of the aeroplane.
c) Dihedral contributes to dynamic but not to static lateral stability.
d) Dihedral is necessary for the execution of slip-free turns.

81.4.6.2 (5574)
Which of the following statements about static lateral and directional stability is correct?
a) An aeroplane with an excessive static directional stability in relation to its static lateral stability, will be prone to spiral dive. (spiral instability)
b) The effects of static lateral and static directional stability are completely independent of each other because they take place about different axis.
c) An aeroplane with an excessive static directional stability in relation to its static lateral stability, will be prone to ""Dutch roll"".
d) Static directional stability can be increased by installing more powerful engines.

81.4.6.2 (5575)
Sensitivity for spiral dive will occur when :
a) the static directional stability is positive and the static lateral stability is relatively weak.
b) the static directional stability is negative and the static lateral stability is positive.
c) the static lateral and directional stability are both negative.
d) the dutch roll tendency is too strongly suppressed by the yaw damper.

81.4.6.3 (5576)
Which one of the following systems suppresses the tendency to ""Dutch roll""?
a) Yaw damper.
b) Roll spoilers.
c) Spoiler mixer.
d) Rudder limiter.

81.4.6.3 (5577)
Which aeroplane behaviour will be corrected by a yaw damper ?
a) Dutch roll.
b) Tuck under.
c) Spiral dive.
d) Buffeting.

81.4.6.3 (5578)
What will increase the sensitivity to Dutch Roll?
a) An increased static lateral stability.
b) An increased static directional stability.
c) A forward movement of the centre of gravity.
d) An increased anhedral.

81.4.6.4 (5579)
With increasing altitude and constant IAS the static lateral stability (1) and the dynamic lateral/directional stability (2) of an aeroplane with swept-back wing will:
a) (1) increase (2) decrease.
b) (1) increase (2) increase.
c) (1) decrease (2) decrease.
d) (1) decrease (2) increase.

81.5.1.1 (5580)
Rotation about the lateral axis is called :
a) pitching.
b) rolling.
c) yawing.
d) slipping.

81.5.1.1 (5581)
Rolling is the rotation of the aeroplane about the:
a) longitudinal axis.
b) vertical axis.
c) lateral axis.
d) wing axis.

81.5.2.0 (5582)
What is the effect on the aeroplane's static longitudinal stability of a shift of the centre of gravity to a more aft location and on the required control deflection for a certain pitch up or down?
a) The static longitudinal stability is smaller and the required control deflection is smaller.
b) The static longitudinal stability is larger and the required control deflection is smaller.

c) The static longitudinal stability is larger and the required control deflection is larger.
d) The static longitudinal stability is smaller and the required control deflection is larger.

81.5.2.4 (5583)
The centre of gravity moving aft will:
a) increase the elevator up effectiveness.
b) decrease the elevator up effectiveness.
c) not affect the elevator up or down effectiveness.
d) increase or decrease the elevator up effectiveness, depending on wing location.

81.5.2.4 (5584)
In a mechanically controlled aeroplane, the most forward allowable position of the centre of gravity could be limited by the:
a) elevator capability, elevator control forces.
b) engine thrust, engine location.
c) trim system, trim tab surface.
d) wing surface, stabilizer surface.

81.5.2.4 (5585)
When the C.G. position is moved forward, the elevator deflection for a manoeuvre with a load factor greater than 1 will be:
a) larger.
b) smaller.
c) unchanged.
d) dependent on trim position.

81.5.3.2 (5586)
An advantage of locating the engines at the rear of the fuselage, in comparison to a location beneath the wing, is :
a) less influence on longitudinal control of thrust changes.
b) easier maintenance of the engines.
c) a wing which is less sensitive to flutter.
d) lighter wing construction.

81.5.3.3 (5587)
What happens during an engine failure with two similar aeroplanes with wing mounted engines, one of them with jet engines, the other one with co-rotating propellers:
a) More roll tendency for the propeller aeroplane.
b) The same yaw tendency for both aeroplanes regardless of left or right engine failure.
c) The same roll tendency for both aeroplanes.
d) Less roll tendency for the propeller aeroplane.

81.5.4.1 (5588)
A jet aeroplane equipped with inboard and outboard ailerons is cruising at its normal cruise Mach number. In this case
a) only the inboard ailerons are active.
b) only the outboard aileron are active.
c) the inboard and outboard ailerons are active.
d) only the spoilers will be active, not the ailerons.

81.5.4.1 (5589)
Flaperons are controls which are used simultaneously as
a) ailerons and flaps.
b) ailerons and elevator.
c) flaps and speed brakes.
d) flaps and elevator.

81.5.4.1 (5590)
When are outboard ailerons (if present) de-activated ?
a) Flaps (and slats) retracted or speed above a certain value.
b) Flaps (and/or slats) extended or speed below a certain value..
c) Landing gear retracted.
d) Landing gear extended.

81.5.4.3 (5591)
During initiation of a turn with speedbrakes extended, the roll spoiler function induces a spoiler deflection:
a) downward on the upgoing wing and upward on the downgoing wing.
b) upward on the upgoing wing and downward on the downgoing wing.
c) on the upgoing wing only.
d) on the downgoing wing only.

81.5.4.5 (5592)
Differential aileron deflection:
a) equals the drag of the right and left aileron.
b) is required to keep the total lift constant when ailerons are deflected.
c) increases the CLmax.
d) is required to achieve the required roll-rate.

81.5.4.5 (5593)
An example of differential aileron deflection during initiation of left turn is:
a) Left aileron: 5° upRight aileron: 2° down
b) Left aileron: 2° upRight aileron: 5° down
c) Left aileron: 5° downRight aileron: 2° up
d) Left aileron: 2° downRight aileron: 5° up

81.5.4.5 (5594)
How is adverse yaw compensated for during entry into and roll out from a turn ?
a) Differential aileron deflection
b) Horn-balanced controls
c) Anti-balanced rudder control
d) Servo tabs

81.5.4.5 (5595)
One method to compensate adverse yaw is a
a) differential aileron.
b) balance tab.
c) antibalance tab.
d) balance panel.

81.5.4.5 (5596)
Which of the following statements concerning control is correct?
a) In a differential aileron control system the control surfaces have a larger upward than downward maximum deflection.
b) On some aeroplanes, the servo tab also serves as a trim tab.
c) Hydraulically powered control surfaces do not need mass balancing.
d) In general the maximum downward elevator deflection is larger than upward.

81.5.4.5 (5597)
Which phenomenon is counteracted with differential aileron deflection?
a) Adverse yaw.
b) Aileron reversal.
c) Sensitivity for spiral dive.
d) Turn co-ordination.

81.5.5.0 (5598)
If the nose of an aeroplane yaws to port (left), this causes:
a) a roll to port (left).
b) a decrease in relative airspeed on the starboard (right) wing.
c) an increase in lift on the port (left) wing.
d) a roll to starboard (right).

81.5.5.0 (5599)
Which moments or motions interact in a dutch roll?
a) Rolling and yawing.
b) Pitching and yawing.
c) Pitching and rolling.
d) Pitching and adverse yaw.

81.5.6.1 (5600)
Which statement is correct about a spring tab ?
a) At high IAS it behaves like a servo tab
b) At low IAS it behaves like a servo tab
c) At high IAS it behaves like a fixed extension of the elevator
d) Its main purpose is to increase stick force per g

81.5.6.1 (5601)
Which kind of "tab" is commonly used in case of manual reversion of fully powered flight controls ?
a) Servo tab
b) Spring tab
c) Balance tab
d) Anti-balance tab

81.5.6.1 (5602)
An aeroplane has a servo-tab controlled elevator. What will happen when only the elevator jams during flight ?
a) Pitch control reverses direction.
b) Pitch control has been lost.
c) The servo-tab now works as a negative trim-tab.
d) The pitch control forces double.

81.5.6.1 (5603)
A horn balance in a control system has the following purpose:
a) to decrease stick forces.
b) to prevent flutter.
c) to obtain mass balancing.
d) to decrease the effective longitudinal dihedral of the aeroplane.

81.5.6.1 (5604)
Which statement about a primary control surface controlled by a servo tab, is correct ?
a) The position is undetermined during taxiing, in particular with tailwind.
b) The servo tab can also be used as a trimtab.
c) The control effectiveness of the primary surface is increased by servo tab deflection.
d) Due to the effectiveness of the servo tab the control surface area can be smaller.

81.5.6.1 (5605)
Examples of aerodynamic balancing of control surfaces are:
a) seal between wing's trailing edge and leading edge of a control surface, horn balance
b) upper and lower rudder, seal between wing's trailing edge and leading edge of a control surface
c) weight in the nose of the control surface, horn balance
d) Fowler flaps, upper and lower rudder

81.5.6.1 (5606)
Examples of aerodynamic balancing of control surfaces are:
a) servo tab, spring tab, seal between the wing trailing edge and the leading edge of control surface.
b) balance tab, horn balance, and mass balance.
c) mass in the nose of the control surface, horn balance and mass balance.
d) spring tab, servo tab, and power assisted control.

81.5.6.2 (5607)
elevator deflection, dynamic pressure.
a) stabilizer position, static pressure.
b) elevator deflection, static pressure.
c) stabilizer position, total pressure.
d) 1994-08-01 0:00

81.5.6.2 (5608)
When power assisted controls are used for pitch control, this:
a) ensures that a part of the aerodynamic forces is still felt on the column.
b) makes trimming superfluous.
c) makes aerodynamic balancing of the control surfaces meaningless.
d) can only function in combination with an elevator trim tab.

81.5.7.1 (5609)
When flutter damping of control surfaces is obtained by mass balancing, these weights will be located with respect to the hinge of the control surface:
a) in front of the hinge.
b) below the hinge.

c) above the hinge.
d) behind the hinge.

81.5.8.0 (5610)
What is the position of the elevator in relation to the trimmable horizontal stabilizer of a power assisted aeroplane, which is in trim ?
a) The position depends on speed, the position of slats and flaps and the position of the centre of gravity.
b) The elevator deflection (compared to the stabilizer position) is always zero.
c) At a forward CG the elevator is deflected upward and at an aft CG the elevator is deflected downward.
d) The elevator is always deflected slightly downwards in order to have sufficient remaining flare capability.

81.5.8.0 (5611)
How would the exterior appearance of an aeroplane change, when trimming for speed increase ?
a) Elevator deflection is increased further downward by an upward deflected trim tab
b) The elevator is deflected further up by a downward deflected trim tab
c) The elevator is deflected further downward by means of a movable horizontal stabiliser
d) The exterior appearance of the aeroplane will not change

81.5.8.2 (5612)
In general transport aeroplanes with power assisted flight controls are fitted with an adjustable stabilizer instead of trim tabs on the elevator. This is because :
a) effectiveness of trim tabs is insufficient for those aeroplanes
b) the pilot does not feel the stick forces at all
c) mechanical adjustment of trim tabs creates too many problems
d) trim tab deflection increases Mcrit

81.5.8.2 (5613)
How does the exterior view of an aeroplane change, when the trim is used during a speed decrease ?
a) The elevator is deflected further upwards by means of a downwards deflected trimtab.
b) The elevator is deflected further downwards by means of a trimmable horizontal stabiliser.
c) Nothing changes in the exterior view.
d) The elevator is deflected further downwards by means of an upwards deflected trimtab.

81.5.8.3 (5614)
If the elevator trim tab is deflected up, the cockpit trim indicator presents:
a) nose-down.
b) neutral.
c) nose-up.
d) nose-left.

81.5.8.3 (5615)
One advantage of a movable-stabilizer system compared with a fixed stabilizer system is that:
a) it is a more powerful means of trimming
b) the structure weighs less
c) it leads to greater stability in flight
d) the system's complexity is reduced

81.5.8.3 (5616)
What should be usually done to perform a landing with the stabilizer jammed in the cruise flight position ?
a) choose a higher landing speed than normal and/or use a lower flapsetting for landing.
b) choose a lower landing speed than normal.
c) if possible, relocate as many passengers as possible to the front of the cabin.
d) use the Mach trimmer until after landing.

81.5.8.3 (5617)
Which statement about a jet transport aeroplane is correct, during take-off at the maximum allowable forward centre of gravity limit, while the THS (Trimmable Horizontal Stabilizer) has been positioned at the maximum allowable AND (Aeroplane Noise Down) position.
a) The rotation will require extra stick force.
b) If the THS position is just within the limits of the green band, the take off warning system will be activated.
c) Early nose wheel raising will take place.
d) Nothing special will happen.

81.5.8.3 (5618)
Which statement about the trim position is true related to centre of gravity and adjustable stabiliser position ?
a) A nose heavy aeroplane requires that the stabiliser leading edge is lower than compared with a tail heavy aeroplane
b) Because characteristic speeds at take off do not vary with centre of gravity location, the need for stabiliser adjustment is dependent on flap position only.
c) A nose heavy aeroplane requires that the stabiliser leading edge is higher than compared with a tail heavy aeroplane.
d) At the forward limit for centre of gravity, stabiliser trim is adjusted maximum Nose Down to obtain maximum elevator authority at take off rotation.

81.6.1.0 (5619)
""Flutter"" may be caused by:
a) distorsion by bending and torsion of the structure causing increasing vibration in the resonance frequency.
b) low airspeed aerodynamic wing stall.
c) roll control reversal.
d) high airspeed aerodynamic wing stall.

81.6.1.1 (5620)
A commercial jet aeroplane is performing a straight descent at a constant Mach Number with constant weight. The operational limit that may be exceeded is:
a) VMO.
b) VNE.
c) VD.
d) MMO.

81.6.1.1 (5621)
VMO :
a) should be not greater than VC.
b) should be chosen in between VC and VD
c) is equal to the design speed for maximum gust intensity.
d) is the calibrated airspeed at which MMO is reached at 35 000 ft.

81.6.1.2 (5622)
A jet transport aeroplane is in a straight climb at a constant IAS and constant weight. The operational limit that may be exceeded is:
a) MMO.
b) VMO.
c) VA.
d) MD.

81.6.1.2 (5623)
Which statement with respect to the climb is correct ?
a) At constant IAS the Mach number increases
b) At constant IAS the TAS decreases
c) At constant Mach number the IAS increases
d) At constant TAS the Mach number decreases

81.6.2.1 (5624)
The relationship between the stall speed VS and VA (EAS) for a large transport aeroplane can be expressed in the following formula:(SQRT= square root)
a) VA= VS SQRT(2.5)
b) VS= VA SQRT(2.5)
c) VS= VA SQRT(3.75)
d) Va= VA SQRT(3.75)

81.6.2.1 (5625)
By what percentage does VA (EAS) alter when the aeroplane's weight decreases by 19%?
a) 10% lower.
b) 4.36% lower.
c) no change
d) 19% lower.

81.6.2.1 (5626)
Which load factor determines VA?
a) manoeuvring limit load factor.
b) manoeuvring ultimate load factor.
c) gust load factor at 66 ft/sec gust.
d) manoeuvring flap limit load factor.

81.6.2.1 (5627)
What can happen to the aeroplane structure flying at a speed just exceeding VA ?
a) It may suffer permanent deformation if the elevator is fully deflected upwards
b) It may break if the elevator is fully deflected upwards.
c) It may suffer permanent deformation because the flight is performed at too large dynamic pressure.
d) It will collapse if a turn is made.

81.6.2.1 (5628)
What is the limit load factor of a large transport aeroplane in the manoeuvring diagram?
a) 2.5
b) 1.5
c) 3.75
d) 6

81.6.2.1 (5629)
VA is:
a) the maximum speed at which maximum elevator deflection up is allowed.
b) the maximum speed at which rolls are allowed.
c) the speed at which a heavy transport aeroplane should fly in turbulence.
d) the speed that should not be exceeded in the climb.

81.6.2.1 (5630)
Load factor is :
a) Lift/Weight
b) Weight/Lift
c) 1/Bank angle
d) Wing loading

81.6.2.1 (5631)
For an aeroplane with one fixed value of VA the following applies. VA is :
a) the speed at which the aeroplane stalls at the manoeuvring limit load factor at MTOW.
b) the maximum speed in smooth air
c) the speed at which unrestricted application of elevator control can be used, without exceeding the maximum manoeuvring limit load factor
d) just another symbol for the rough air speed

81.6.2.1 (5632)
The positive manoeuvring limit load factor for a large jet transport aeroplane with flaps extended is:
a) 2.0
b) 1.5
c) 2.5
d) 3.75

81.6.2.1 (5633)
The positive manoeuvring limit load factor for a light aeroplane in the utility category in the clean configuration is:
a) 4.4
b) 2.5
c) 3.8
d) 6.0

81.6.3.0 (5634)
Which statement regarding the gust load factor on an aeroplane is correct (all other factors of importance being constant) ?1. Increasing the aspect-ratio of the wing will increase the gust load factor.2. Increasing the speed will increase the gust load factor.
a) 1 and 2 are correct.
b) 1 is incorrect and 2 is correct.
c) 1 and 2 are incorrect.
d) 1 is correct and 2 is incorrect.

81.6.3.0 (5635)
Which of the following statements is true?
a) Limiting factors in severe turbulence are the possibility of a stall and the margin to the structural limitations
b) Through extension of the flaps in severe turbulence it is possible to reduce the speed and increase the margins to the structural limits
c) By increasing the flap setting in severe turbulence the stall speed will be reduced and the risk for exceeding the structural limits will be decreased
d) Through extension of the flaps in severe turbulence the centre of pressure will move aft which will increase the margins to the structural limits

81.6.3.1 (5636)
The lift coefficient (CL) of an aeroplane in steady horizontal flight is 0.42, increase in angle of attack of 1 degree increases CL by is 0.1. A vertical up gust instantly changes the angle of attack by 3 degrees. The load factor will be :
a) 1.71
b) 0.74
c) 1.49
d) 2.49

81.6.3.1 (5637)
The lift coefficient (CL) of an aeroplane in steady horizontal flight is 0.4. Increase of angle of attack of 1 degree will increase CL by 0.09. A vertical up gust instantly changes the angle of attack by 5 degrees. The load factor will be :
a) 2.13
b) 1.09
c) 2.0
d) 3.18

81.6.3.1 (5638)
The shape of the gust load diagram is also determinated by the following three vertical speed in ft/s (clean configuration) :
a) 25, 50, 66
b) 15, 56, 65
c) 25, 55, 75
d) 35, 55, 66

81.6.3.1 (5639)
Which combination of speeds is applicable for structural strength in gust (clean configuration) ?
a) 50 ft/sec and VC.
b) 66 ft/sec and VD.
c) 65 ft/sec at all speeds.
d) 55 ft/sec and VB.

81.6.3.1 (5640)
The extreme right limitation for both V-n (gust and manoeuvre) diagrams is created by the speed:
a) VD
b) VC
c) Vflutter
d) VMO

81.6.3.1 (5641)
The lift coefficient (CL) of an aeroplane in steady horizontal flight is 0.35. Increase in angle of attack of 1 degree will increase CL by 0.079. A vertical up gust instantly changes the angle of attack by 2 degrees. The load factor will be :
a) 1.45
b) 0.9
c) 0.45
d) 1.9

81.6.3.1 (5642)
Which has the effect of increasing load factor ? (all other relevant factors being constant)
a) Vertical gusts
b) Increased aeroplane mass
c) Increased air density
d) Rearward CG location

81.6.3.2 (5643)
What wing shape or wing characteristic is the least sensitive to turbulence :
a) swept wings
b) straight wings
c) wing dihedral
d) winglets

81.6.3.2 (5644)
Which statement is correct about the gust load on an aeroplane (IAS and all other factors of importance remaining constant) ?1. the gust load increases, when the weight decreases.2. the gust load increases, when the altitude increases.
a) 1 is correct and 2 is incorrect.
b) 1 and 2 are correct.
c) 1 and 2 are incorrect.
d) 1 is incorrect and 2 is correct.

81.7.1.0 (5645)
The angle of attack for a propeller blade is the angle between blade chord line and:
a) Local air speed vector.
b) Direction of propeller axis.
c) Aeroplane heading.
d) Principal direction of propeller blade.

81.7.1.1 (5646)
Which of these definitions of propeller parameters is correct?
a) geometric propeller pitch = the theoretical distance a propeller blade element is travelling in forward direction in one propeller revolution
b) Blade angle = angle between blade chord line and propeller axis
c) Propeller angle of attack = angle between blade chord line and propeller vertical plane
d) Critical tip velocity = propeller speed at which risk of flow separation at some parts of propeller blade occurs.

81.7.1.2 (5647)
Why is a propeller blade twisted from root to tip?
a) Because the local angle of attack of a blade segment is dependent on the ratio of that segment 's speed in the plane of rotation and the true airspeed of the aeroplane.
b) Because the local angle of attack of a blade segment is dependent on the ratio of that segment 's speed in the plane of rotation and the angular velocity of the propellers.
c) To ensure that the root produces most thrust.
d) To ensure that the tip produces most thrust.

81.7.1.3 (5648)
Constant-speed propellers provide a better performance than fixed-pitch propellers because they:
a) produce an almost maximum efficiency over a wider speed range.
b) have a higher maximum efficiency than a fixed-pitch propeller.
c) produce a greater maximum thrust than a fixed-pitch propeller.
d) have more blade surface area than a fixed-pitch propeller.

81.7.1.3 (5649)
If you push forward the RPM lever of a constant speed propeller during a glide with idle power and constant speed, the propeller pitch will:
a) decrease and the rate of descent will increase.
b) increase and the rate of descent will decrease.
c) increase and the rate of descent will increase.
d) decrease and the rate of descent will decrease.

81.7.1.3 (5650)
Does the pitch-angle of a constant-speed propeller alter in medium horizontal turbulence?
a) Yes slightly.
b) Yes strongly.
c) No.
d) Yes, but only if the pitch is full-fine.

81.7.1.3 (5651)
Which of the following statements about a constant speed propeller is correct?
a) The blade angle increases with increasing speed.
b) The propeller system keeps the aeroplane speed constant.
c) The RPM decreases with increasing aeroplane speed.
d) The selected RPM is kept constant by the manifold pressure.

81.7.1.3 (5652)
The propeller blade angle of attack on a fixed pitch propeller is increased when :
a) RPM increases and forward velocity decreases
b) velocity and RPM increase
c) forward velocity increases and RPM decreasing
d) velocity and RPM decrease

81.7.1.3 (5653)
If you decrease the propeller pitch during a glide with idle-power at constant IAS the lift to drag ratio will
a) decrease and the rate of descent will increase.
b) increase and the rate of descent will increase.
c) decrease and the rate of descent will decrease.
d) increase and the rate of descent will decrease.

81.7.1.3 (5654)
If you increase the propeller pitch during a glide with idle-power at constant IAS the lift to drag ratio will
a) increase and the rate of descent will decrease.
b) increase and the rate of descent will increase.
c) decrease and the rate of descent will decrease.
d) decrease and the rate of descent will increase.

81.7.1.4 (5655)
For a fixed-pitch propeller designed for cruise, the angle of attack of each blade, measured at the reference section:
a) is optimum when the aircraft is in a stabilized cruising flight.
b) decreases when the aircraft speed decreases (with identical engine RPM).
c) is lower in ground run than in flight (with identical engine RPM).
d) is always positive during idling descent.

81.7.1.4 (5656)
Propeller efficiency may be defined as the ratio between:
a) usable (power available) power of the propeller and shaft power.
b) the thrust and the maximum thrust.
c) the usable (power available) power and the maximum power.
d) the thermal power of fuel-flow and shaft power.

81.7.2.1 (5657)
If you pull back the RPM lever of a constant speed propeller during a glide with idle power and constant speed, the propeller pitch will:
a) increase and the rate of descent will decrease.
b) increase and the rate of descent will increase.
c) decrease and the rate of descent will decrease.
d) decrease and the rate of descent will increase.

81.7.2.1 (5658)
An engine failure can result in a windmilling (1) propeller and a non rotating (2) propeller. Which statement about propeller drag is correct?
a) (1) is larger than (2).
b) (1) is equal to (2).

c) (2) is larger than (1).
d) impossible to say which one is largest.

81.7.2.1 (5659)
When the blades of a propeller are in the feathered position:
a) the drag of the propeller is then minimal.
b) the propeller produces an optimal windmilling RPM.
c) the windmilling RPM is the maximum.
d) the RPM is then just sufficient to lubricate the engine.

81.7.3.3 (5660)
Increasing the number of propeller blades will:
a) increase the maximum absorption of power.
b) increase the propeller efficiency.
c) increase the noise level at maximum power.
d) decrease the torque in the propeller shaft at maximum power.

81.7.3.3 (5661)
Which is one of the disadvantages of increasing the number of propeller blades ?
a) decrease propeller efficiency
b) Increased noise
c) Less power can be absorbed by the propeller
d) Higher tip-speed

81.7.4.1 (5662)
A propeller turns to the right, seen from behind. The torque effect in the take-off will:
a) roll the aeroplane to the left.
b) pitch the aeroplane nose down.
c) roll the aeroplane to the right.
d) pitch the aeroplane nose up.

81.7.4.2 (5663)
Gyroscopic precession of the propeller is induced by:
a) pitching and yawing.
b) pitching and rolling.
c) increasing RPM and yawing.
d) increasing RPM and rolling.

81.7.4.4 (5664)
A propeller is turning to the right, seen from behind. The asymmetric thrust effect is mainly induced by:
a) high angles of attack.
b) high speed.
c) large angles of yaw.
d) large angles of climb.

81.7.4.4 (5665)
A propeller is turning to the right, seen from behind. The asymmetric thrust effect in the climb will:
a) yaw the aeroplane to the left.
b) roll the aeroplane to the left.
c) yaw the aeroplane to the right.
d) roll the aeroplane to the right.

81.8.1.2 (5666)
The lift of an aeroplane of weight W in a constant linear climb with a climb angle (gamma) is approximately:
a) Wcos.gamma.
b) W(1-sin.gamma).
c) W(1-tan.gamma).
d) W/cos.gamma.

81.8.1.3 (5667)
An aeroplane performs a continuous descent with 160 kts IAS and 1000 feet/min vertical speed. In this condition:
a) weight is greater than lift
b) lift is equal to weight
c) lift is less than drag
d) drag is less than the combined forces that move the aeroplane forward

81.8.1.4 (5668)
What factors determine the distance travelled over the ground of an aeroplane in a glide ?
a) The wind and the lift/drag ratio, which changes with angle of attack
b) The wind and the aeroplane's mass
c) The wind and CLmax
d) The wind and weight together with power loading, which is the ratio of power output to the weight

81.8.1.4 (5669)
What is the correct relation of the True Air Speed (TAS) for minimum sink rate (VR/Dmin) and best glide angle (VBest glide) at a given altitude?
a) VR/Dmin < VBest glide
b) VR/Dmin = VBest glide
c) VR/Dmin > VBest glide
d) VR/Dmin > VBest glide or VR/Dmin < VBest glide depending on the type of aeroplane.

81.8.1.4 (5670)
Which statement is correct at the speed for minimum drag (subsonic) ?
a) The gliding angle is minimum.
b) The CL/CD ratio is minimum.
c) Induced drag is greater than the parasite drag.
d) Propeller aeroplanes fly at that speed at max. endurance.

81.8.1.4 (5671)
Which of the following factors will lead to an increase of ground distance during a glide ?
a) tailwind
b) headwind

c) increase of aeroplane weight
d) decrease of aeroplane weight

81.8.1.5 (5672)
A jet aeroplane is rolled into a turn, while maintaining airspeed and holding altitude. In such a case, the pilot has to:
a) increase thrust and angle of attack.
b) increase thrust and keep angle of attack unchanged.
c) increase thrust and decrease angle of attack.
d) increase angle of attack and keep thrust unchanged.

81.8.1.5 (5673)
An aeroplane is in a steady turn, at a constant TAS of 300 kt, and a bank angle of 45°. Its turning radius is equal to:(given: g= 10 m/s²)
a) 2381 metres.
b) 4743 metres.
c) 9000 metres.
d) 3354 metres.

81.8.1.5 (5674)
By what percentage does the lift increase in a steady level turn at 45° angle of bank, compared to straight and level flight?
a) 41%.
b) 19%.
c) 31%.
d) 52%.

81.8.1.5 (5675)
A light twin is in a turn at 20 degrees bank and 150 kt TAS. A more heavy aeroplane at the same bank and the same speed will:
a) turn at the same turn radius.
b) turn at a bigger turn radius.
c) turn at a smaller turn radius.
d) turn at a higher turn rate.

81.8.1.5 (5676)
The bank angle in a rate-one turn depends on:
a) TAS.
b) weight.
c) load factor.
d) wind.

81.8.1.5 (5677)
The turn indicator shows a right turn. The slip indicator is left of neutral. To coordinate the turn:
a) more right bank is required.
b) more right rudder is required.
c) less right bank is required.
d) a higher turn rate is required.

81.8.1.5 (5678)
What is the approximate value of the lift of an aeroplane at a gross weight of 50 000 N, in a horizontal coordinated 45 degrees banked turn ?
a) 70 000 N
b) 60 000 N
c) 50 000 N
d) 80 000 N

81.8.2.1 (5679)
Which statement is correct about an aeroplane, that has experienced a left engine failure and continues afterwards in straight and level cruise flight with wings level ?
a) turn indicator neutral, slip indicator neutral.
b) turn indicator neutral, slip indicator left of neutral.
c) turn indicator left of neutral, slip indicator left of neutral.
d) turn indicator left of neutral, slip indicator neutral.

81.8.2.9 (5680)
Which of the following statements is correct ?I When the critical engine fails during take-off the speed VMCL can be limiting.II The speed VMCL is always limited by maximum rudder deflection.
a) I is incorrect, II is incorrect
b) I is correct, II is correct
c) I is correct, II is incorrect
d) I is incorrect, II is correct

81.8.2.9 (5681)
I is incorrect, II is correct
a) I is correct, II is correct
b) I is incorrect, II is incorrect
c) I is correct, II is incorrect
d) 1998-10-05 0:00

81.8.2.9 (5682)
I is correct, II is correct
a) I is incorrect, II is incorrect
b) I is correct, II is incorrect
c) I is incorrect, II is correct
d) 1998-10-05 0:00

81.8.2.10 (5683)
Why is VMCG determined with the nosewheel steering disconnected?
a) Because the value of VMCG must also be applicable on wet and/or slippery runways.
b) Because the nosewheel steering could become inoperative after an engine has failed.
c) Because it must be possible to abort the take-off even after the nosewheel has already been lifted off the ground.
d) Because nosewheel steering has no effect on the value of VMCG.

81.8.2.11 (5684)
decreases, because the engine thrust decreases.

a) decreases, because VMCG is expressed in IAS and the IAS decreases with TAS constant and decreasing density
b) increases, because at a lower density a larger IAS is necessary to generate the required rudder force
c) increases, because VMCG is related to V1 and VR and those speeds increase if the density decreases
d) 1998-10-05 0:00

81.8.3.3 (5685)
(For this question use annex 081-6262A)Which point marks the value for minimum sink rate?
a) Point c
b) Point a
c) Point b
d) Point d

81.8.3.3 (5686)
(For this question use annex 081-6263A)Which point in the diagram gives the best glide condition?
a) Point b
b) Point a
c) Point c
d) Point d

81.8.3.3 (5687)
(For this question use annex 081-6264A)Which point in the diagram gives the lowest speed in horizontal flight?
a) Point d
b) Point a
c) Point b
d) Point c

81.8.3.3 (5688)
From the polar diagram of the entire aeroplane one can read:
a) the maximum CL/CD ratio and maximum lift coefficient.
b) the minimum drag and the maximum lift.
c) the minimum drag coefficient and the maximum lift.
d) the minimum CL/CD ratio and the minimum drag.

81.8.3.3 (5689)
(CL/CD)max
a) CLmax
b) (CL/CD^2)max
c) (CL^3/CD^2)max
d) 1998-10-05 0:00

91.1.1.0 (5690)
What does the term ""blind transmission"" mean?
a) A transmission from one station to another station in circumstances where two-way communication cannot be established but it is believed that the called station is able to receive the transmission.
b) A transmission of information relating to air navigation that is not addressed to a specific station or stations.
c) A transmission of messages relating to en-route weather information which may affect the safety of aircraft operations that is not addressed to a specific station or stations.
d) A transmission where no reply is required from the receiving station.

91.1.2.0 (5691)
Which abbreviation is used for the term ""control zone""?
a) CTR.
b) CZ.
c) CTZ.
d) CTA.

91.1.2.0 (5692)
What does the abbreviation ""AFIS"" mean?
a) Aerodrome flight information service.
b) Automatic flight information service.
c) Aeronautical flight information system.
d) Aerodrome flashing identification signal.

91.1.2.0 (5693)
What does the abbreviation ""FIR"" mean?
a) Flight information region.
b) Flight information required.
c) Flow information received.
d) Flight information radar.

91.1.2.0 (5694)
What does the abbreviation ""HJ"" mean?
a) Sunrise to sunset.
b) Sunset to sunrise.
c) No specific working hours.
d) Continuous day and night service.

91.1.2.0 (5695)
What does the abbreviation ""HX"" mean?
a) No specific working hours.
b) Sunrise to sunset.
c) Sunset to sunrise.
d) Continuous day and night service.

91.1.2.0 (5696)
Which abbreviation is used for ""Co-ordinated universal time""?
a) UTC.
b) CUT.
c) GMT.
d) COUT.

91.1.3.0 (5697)
What does QTE mean?