

# Examination Center DGAC

Examination Date \_\_\_\_\_

Name \_\_\_\_\_

Firstname \_\_\_\_\_

Birthday \_\_\_\_\_

- 1 The error in altimeter readings caused by the variation of the static pressure near the source is known as: (1.00 P.)
- [A] barometric error.
  - [B] position error.
  - [C] hysteresis effect.
  - [D] instrument error.

- 2 The following figures appear on an aeroplane deviation card:

FOR MAGNETIC	STEER COMPASS
045	038
090	092

The compass heading to steer to maintain a heading of 075?(M) is: (1.00 P.)

[A] 076

[B] 072

[C] 074

[D] 078

- 3 An aeroplane heading 030? (C) in the Southern Hemisphere, turns left onto 170? (C) using a direct reading magnetic compass. The roll out of the turn should be initiated on a compass heading off: (1.00 P.)

[A] 195?

[B] 215?

[C] 145?

[D] 170?

- 4 If the static source of an altimeter becomes blocked during a descent the instrument will: (1.00 P.)
- [A] continue to display the reading at which the blockage occurred
  - [B] gradually indicate zero
  - [C] indicate a height equivalent to the setting on the millibar subscale
  - [D] under-read

- 5 A compass is swing using the Relative bearing method. The magnetic Bearing of a distant object is 210°(M)

COMPASS HEADING    RELATIVE BEARING

359	208
090	121
179	032
272	301

Co-eff A, B and C are: (1.00 P.)

- |     |           |         |         |
|-----|-----------|---------|---------|
| [A] | A = - 0.5 | B = + 1 | C = + 2 |
| [B] | A = + 0.5 | B = + 1 | C = - 2 |
| [C] | A = + 0.5 | B = + 2 | C = - 2 |
| [D] | A = - 0.5 | B = + 2 | C = + 2 |

- 6 If the static source to an altimeter becomes blocked during a climb, the instrument will: (1.00 P.)
- [A] continue to indicate the reading at which the blockage occurred
  - [B] gradually return to zero
  - [C] over-read
  - [D] under-read by an amount equivalent to the reading at the time that the instrument became blocked

- 7 An aircraft at FL230, temperature  $-41^{\circ}\text{C}$ , QNH 983 HPA, is at a true altitude of:  
(1.00 P.)
- [A] 21 050 feet
  - [B] 24 015 feet
  - [C] 22 200 feet
  - [D] 23 013 feet

- 8 A direct reading magnetic compass shows: Co-eff A= -2, Co-eff. B = + 2 and Co-eff C = +3.

The heading on which zero deviation occurs are:  
(1.00 P.)

- [A] 303.7° and 123.7°
- [B] 090.0° and 337.3°
- [C] 180° and 273.3°
- [D] 056.3° and 236.3°



- 9 While climbing to FL250, the altimeter is set correctly. On descent it is Not set to QNH 1037.8 hPa. If the aerodrome elevation is 650 FT and the altimeter is functioning properly, after landing the altimeter will indicate: (1.00 P.)
- [A] 738 FT
  - [B] minus 88 FT
  - [C] 650 FT
  - [D] 1388 FT
- 10 The QFE at aerodrome (elevation) 1790 feet is 962 hPa and the QNH 1022 hPa. If the transition level is FL040 the physical level of the transition level above the aerodrome is approximately: (1.00 P.)
- [A] 2280 feet
  - [B] 1790 feet
  - [C] 2464 feet
  - [D] 2150 feet
- 11 The elevation of aerodrome A is 390 feet and aerodrome B 450 feet. The pilot of an aeroplane at A, sets the altimeter to read aerodrome elevation and then flies to B without resetting the altimeter. Aerodrome pressure at A on a departure was 1004 hPa. On landing at B the altimeter reads 630 feet, and assuming 1 hPa is 30 feet, the QNH is approximately: (1.00 P.)
- [A] 1019 hPa
  - [B] 1013 hPa
  - [C] 1011 hPa
  - [D] 1019 hPa

- 12 With QFE 1014 set at A (elevation 480 feet), an aircraft flies to B (QNH 1020) a distance of 780 NM. In order to have minimum clearance of 1500 ft over a hill 490 meters above sea level, 234 NM from A, the altimeter must read: (1.00 P.)
- [A] 2586 ft
  - [B] 3108 ft
  - [C] 3048 ft
  - [D] 2718 ft

- 13 A direct reading magnetic compass has coefficients A, B and C only.  
Deviations on 000°(C) is 0°. Deviation on 090°(C) is +3. Co-efficient C is +2.  
The deviation on 180°(C) is: (1.00 P.)
- [A] +2
  - [B] -4
  - [C] -2
  - [D] 0

- 14 If an altimeter indicates 3500 FT with the actual QNH of 1004, 7 hPa set, the approximate pressure altitude is:  
(1.00 P.)
- [A] 3255 FT
  - [B] 3500 FT
  - [C] 3745 FT
  - [D] 3965 FT

- 15 When ambient temperature is warmer than standard at a particular aerodrome, the altimeter will indicate:

(1.00 P.)

- [A] the same as true altitude
- [B] higher than true altitude
- [C] the same as pressure altitude
- [D] lower than true altitude

- 16 A direct reading magnetic compass is affected by coefficients B and C only, which together cause a maximum deviation of 7 degrees West on heading 247°(C). The respective values of coefficients B and C are:  
(1.00 P.)
- [A] B 2.73 and C 6.44
  - [B] B 3.83 and C 3.24
  - [C] B -3.20 and C -380
  - [D] B 6.44 and C 2.73

- 17 If the static source to an airspeed indicator (ASI) becomes blocked during a descent the instrument will: (1.00 P.)
- [A] continue to indicate the speed applicable to that at the time of the blockage
  - [B] under-read
  - [C] read zero
  - [D] over-read

- 18 When climbing at a constant Mach number: (1.00 P.)
- [A] CAS increases.
  - [B] difference between surrounding conditions and ISA must be known to deduce the CAS variation.
  - [C] CAS remains constant.
  - [D] CAS decreases.



- 19 The following figures appear on an aeroplane deviation card:

FOR MAGNETIC                      STEER COMPASS

065

058

110

112

The compass heading to steer to maintain a heading of 095°(M) is: (1.00 P.)

[A] 092

[B] 096

[C] 094

[D] 090

- 20 The reported QNH of a given station is the:  
(1.00 P.)
- [A] station`s standard pressure of 1013.2
  - [B] actual barometric pressure measured at the station
  - [C] station`s barometric pressure corrected to mean sea level pressure
  - [D] actual barometric pressure measured at sea level

- 21 At a constant pressure altitude of 1 250 feet, a temperature drop from 29 C to 18 C will cause the density altitude to:  
(1.00 P.)
- [A] increase by 1 200 feet
  - [B] decrease by 1 870 feet
  - [C] increase by 1 800 feet
  - [D] decrease by 1 250 feet

- 22 The deviations of a direct reading magnetic compass effected only by coefficient B and C are, 3 E on 230 (C) and 4 W on 130 (C), therefore the deviation on heading 315 (C) is:  
(1.00 P.)
- [A] 7.5 W
  - [B] 4.5 W
  - [C] 7.5 E
  - [D] 3.3 E

- 23 The QNH is by definition the value of the: (1.00 P.)
- [A] atmospheric pressure at the sea level of the location for which it is given.
  - [B] altimeter setting so that the altimeter, on the apron of the aerodrome for which it is given, reads zero.
  - [C] altimeter setting so that the altimeter, on the apron of the aerodrome for which it is given, reads the elevation.
  - [D] atmospheric pressure at the level of the ground overflown by the aircraft.

- 24 The velocity of sound at the sea level in a standard atmosphere is: (1.00 P.)
- [A] 644 kt.
  - [B] 332 kt.
  - [C] 1059 kt.
  - [D] 661 kt.

- 25    Given:  
      Pt: total pressure  
      Ps: static pressure  
      Pd: dynamic pressure

The altimeter is fed by: (1.00 P.)

- [A]   Ps-Pt.
- [B]   Pt-Pd.
- [C]   Pd.
- [D]   Pd-Ps.

- 26 Co-eff B is negative and one third the value of Co-eff. C which is positive.  
The heading on which zero deviation occur are:  
(1.00 P.)
- [A] 71.6 and 250.6
  - [B] 18.4 and 198.4
  - [C] 108.4 and 288.4
  - [D] 184.4 and 298.6



- 27 Maintaining CAS and flight level constant, a fall in ambient temperature results in: (1.00 P.)
- [A] higher TAS because air density increases.
  - [B] lower TAS because air density increases.
  - [C] higher TAS because air density decreases.
  - [D] lower TAS because air density decreases.
- 28 In standard atmosphere, when descending at constant CAS: (1.00 P.)
- [A] TAS first increases and then remains constant above the tropopause.
  - [B] TAS decreases.
  - [C] TAS remains constant.
  - [D] TAS increases.

- 29 A direct reading magnetic compass is affected by coefficient B and C only, which together cause a maximum deviation of 5 degrees West on heading 307 (C). The respective values of coefficients B and C are (1.00 P.)
- [A] B -5 and C +1
  - [B] B +4 and C -3
  - [C] B +7 and C -6
  - [D] B -3 and C -3

- 30 The magnetic system of a compass is suspended pendulously to counteract the effect of component:  
(1.00 P.)
- [A] Z
  - [B] H
  - [C] P
  - [D] L

- 31 A leak in the pitot total pressure line of a non-pressurized aircraft to an airspeed indicator would cause it to: (1.00 P.)
- [A] over-read.
  - [B] under-read in a climb and over-read in a descent.
  - [C] over-read in a climb and under-read in a descent.
  - [D] under-read.

32 Machmeter readings are subject to: (1.00 P.)

- [A] density error.
- [B] setting error.
- [C] temperature error.
- [D] position and pressure error

- 33 In flight, a cantilever wing of an airplane containing fuel undergoes vertical loads which produce a bending moment: (1.00 P.)
- [A] equal to the zero -fuel weight multiplied by the span
  - [B] lowest at the wing root
  - [C] equal to half the weight of the aircraft multiplied by the semi span
  - [D] highest at the wing root

- 34 The trim tab: (1.00 P.)
- [A] reduces hinge moment and increases control surface efficiency.
  - [B] increases hinge moment and control surface efficiency.
  - [C] increases hinge moment and reduces control surface efficiency.
  - [D] reduces hinge moment and control surface efficiency.

- 35 During a turn the remote indicator of a CL2 compass remains synchronised with the actual heading because:  
(1.00 P.)
- [A] error signals raised in the stators of the gyro unit data selsyn are repeated in the stators of the master indicator
  - [B] the detector unit, signal selsyn stator and horizontal gyro, rotate with the aircraft in the opposite direction at the same rate
  - [C] the detector unit, signal selsyn stator and horizontal gyro, rotate with the aircraft in the same direction at the same rate
  - [D] the horizontal gyro due to its rigidity drives the pointers keeping them aligned with the heading



- 36 The purpose of a trim tab (device) is to: (1.00 P.)
- [A] lower manoeuvring control forces.
  - [B] reduce or to cancel control forces.
  - [C] trim the aeroplane at low airspeed.
  - [D] trim the aeroplane during normal flight.

37 The indications on a directional gyroscope are subject to errors. The most significant are:

- 1- apparent wander due to earth rotation.
- 2- apparent wander due to change of aircraft position.
- 3- gimbaling errors.
- 4- north change.
- 5- mechanical defects.

The combination regrouping the correct statement is: (1.00 P.)

- [A] 1,2,3,5.
- [B] 2,3,5.
- [C] 3,4,5.
- [D] 1,2,4,5.

- 38 The diagram shows three gyro assemblies: A, B and C. Among these gyros,  
-one is a roll gyro (noted 1)  
-one is a pitch gyro (noted 2)  
-one is a yaw gyro (noted 3)  
The correct matching of gyros and assemblies is: (1.00 P.)

Siehe Anlage 1

- [A] 1A, 2B, 3C
- [B] 1B, 2A, 3C
- [C] 1C, 2B, 3A
- [D] 1B, 2C, 3A

- 39 During a pre-flight check the following details were noted:
- |                                    |                 |
|------------------------------------|-----------------|
| Airfield Elevation                 | 4800 ft         |
| Apron Elevation                    | 4780 ft         |
| Height of static vent above ground | 25 ft           |
| Altimeter reading (QFE)            | 35 ft (1.00 P.) |
- [A] 60 ft over read
- [B] 05 ft under read
- [C] 30 ft over read
- [D] 30 ft under read

- 40 A torsion link assembly is installed on the landing gear to: (1.00 P.)
- [A] lock the landing gear.
  - [B] control the wheels.
  - [C] absorb the spring tension.
  - [D] avoid rotation of the piston rod relative to the gear oleo strut.
- 41 In a commercial transport aircraft the landing gear operating system is usually: (1.00 P.)
- [A] Electrically driven.
  - [B] Mechanically driven.
  - [C] Hydraulically driven.
  - [D] Pneumatically driven.

- 42 The value of the compressibility error of an Airspeed Indicator (ASI) will:  
(1.00 P.)
- [A] decrease, with a decrease in density and increase with an increase in IAS
  - [B] decrease with an increase in true airspeed and decrease with an increase in altitude
  - [C] increase with an increase in true airspeed and decrease with an increase in altitude
  - [D] increase with increase in altitude and true airspeed

- 43 Generally, on modern jet transport aircraft, how can the landing gear be extended if there is a complete hydraulic system failure. (1.00 P.)
- [A] Pneumatically.
  - [B] By hydraulic accumulators.
  - [C] Mechanically
  - [D] Electrically.

- 44 Flying at FL 430 the OAT is -59°C. The deviation from Jet Standard Atmosphere is:

(1.00 P.)

[A] +2.7

[B] +12

[C] -2.5

[D] -10



- 45 If the static vent becomes blocked during a climb the machmeter will:  
(1.00 P.)
- [A] overread
  - [B] under read
  - [C] read zero
  - [D] read correctly

- 46 While inertial platform system is operating on board an aircraft, it is necessary to use a device with the following characteristics, in order to keep the vertical line with a pendulous system: (1.00 P.)
- [A] without damping and a period of about 84 seconds
  - [B] with damping and a period of about 84 minutes.
  - [C] with damping and a period of 84 seconds
  - [D] without damping and a period of about 84 minutes

- 47 Ambient static pressure is fed to the ASI in flight to:  
(1.00 P.)
- [A] add static pressure entering the instrument diaphragm through the pitot tube
  - [B] subtract the static pressure from the dynamic pressure
  - [C] cancel static pressure entering the instrument diaphragm through the pitot tube
  - [D] cancel dynamic pressure in the pitot tube

- 48 In order to align an inertial reference system (IRS), it is required to insert the local geographical coordinates. This enables the IRS to: (1.00 P.)
- [A] compare the longitude it finds with that entered by the operator.
  - [B] initialise the FMS flight plan.
  - [C] compare the latitude it finds with that entered by the operator.
  - [D] find true north.

- 49 The Principal and Operation of the Machmeter precludes the following errors:  
(1.00 P.)
- [A] density, compressibility and pressure errors
  - [B] lag, density and barometric errors
  - [C] position, density and barometric errors
  - [D] temperature, compressibility and density errors

- 50 At FL410 the temperature deviation from the Jet Standard Atmosphere is +5°C.  
The outside air temperature is:  
(1.00 P.)
- [A] -51.5°C
  - [B] -67°C
  - [C] -62°C
  - [D] -77°C

51 Mach No. is equal to:

(1.00 P.)

[A]  $\frac{P + S}{S}$

[B]  $\frac{S + S}{P}$

[C]  $\frac{P - S}{S}$

[D]  $P - S + S$

- 52 In hydraulic systems of large modern transport category aircraft the fluids used are: (1.00 P.)
- [A] Vegetable oil.
  - [B] Water and glycol.
  - [C] Synthetic oil.
  - [D] Mineral oil.
- 53 The type of hydraulic oil used in modern hydraulic systems is: (1.00 P.)
- [A] mixture of mineral oil and alcohol
  - [B] synthetic oil
  - [C] mineral oil
  - [D] vegetable oil



- 54 Cabin pressurization is controlled by the: (1.00 P.)
- [A] engine's bleed valves.
  - [B] cabin inlet airflow.
  - [C] cabin outflow valve.
  - [D] engine's RPM.
- 55 Cabin differential pressure means the pressure difference between: (1.00 P.)
- [A] actual cabin pressure and selected pressure.
  - [B] cabin pressure and ambient air pressure.
  - [C] cabin pressure and ambient air pressure at MSL.
  - [D] cockpit and passenger cabin.

56 Pneumatic mechanical ice protection system are mainly used for: (1.00 P.)

- [A] propellers.
- [B] wings.
- [C] windcreens.
- [D] pitot tubes.

- 57 The type of brake unit found on most transport aeroplanes is a: (1.00 P.)
- [A] Drum type brake.
  - [B] Belt brake.
  - [C] Multiple disk brake.
  - [D] Single disk brake.

- 58 On modern transport aircraft, cockpit windows are protected against icing by:  
(1.00 P.)
- [A] Vinyl coating.
  - [B] Electric heating.
  - [C] Rain repellent system.
  - [D] Anti-icing fluid.

- 59 In flight, the most commonly used anti-icing method for the wings of modern commercial aircraft fitted with turbo-jet units is: (1.00 P.)
- [A] Physical/chemical (glycol-based liquid).
  - [B] Mechanical (pneumatic source which acts by deforming the profiles of the leading edge).
  - [C] Electrical (electrical resistances).
  - [D] Thermal (use of hot air).

- 60 The reason for fitting thermal plugs to aircraft wheels is that they: (1.00 P.)
- [A] prevent the brakes from overheating.
  - [B] release air from the tyre in the event of overpressure.
  - [C] release air from the tyre in the event of overheating.
  - [D] prevent heat transfer from the brake disks to the tyres.

- 61 With regard to pneumatic mechanical devices that afford ice protection the only correct statement is: (1.00 P.)
- [A] They can only be used as de-icing devices.
  - [B] They can only be used as anti-icing devices.
  - [C] They can be used as both de-icing and anti-icing devices.
  - [D] They are used extensively on modern aircraft as they are inexpensive and easy to maintain.

- 62 The heating facility for the windshield of an aircraft is: (1.00 P.)
- [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.



63 On a jet aircraft fuel heaters are: (1.00 P.)

- [A] Installed in each tank.
- [B] not necessary at all.
- [C] Installed only in the centre tank.
- [D] Located on the engines.

- 64 Thermal plugs are installed in: (1.00 P.)
- [A] fire warning systems.
  - [B] wheel rims.
  - [C] cargo compartments.
  - [D] cabin windows.

- 65 As altitude increases, the mixture ratio of a piston engine should be adjusted to :  
(1.00 P.)
- [A] increase the mixture ratio.
  - [B] increase the fuel flow in order to compensate for the decreasing air pressure and density.
  - [C] reduce the fuel flow in order to compensate for the increasing air density.
  - [D] reduce the fuel flow in order to compensate for the decreasing air density.

- 66 The radio altimeter is required to indicate zero height AGL as the main wheels touch down on the runway. For this reason, it is necessary to: (1.00 P.)
- [A] adjust the gross height according to the aircraft instantaneous pitch.
  - [B] change the display scale in short final, in order to have a precise readout.
  - [C] have a specific radio altimeter dedicated to automatic landing.
  - [D] compensate for residual height and cable length.

- 67 When applying carburettor heating: (1.00 P.)
- [A] a decrease in RPM results from the lean mixture.
  - [B] the mixture becomes richer.
  - [C] no change occurs in the mixture ratio.
  - [D] the mixture becomes leaner.

68 The low-altitude radio altimeters used in precision approaches:

1 operate in the 1540-1660 MHz range.

2 are of the pulsed type.

3 are of the frequency modulation type.

4 have an operating range of 0 to 5000 ft.

5 have a precision of +/- 2 feet between 0 and 500 ft and +/- 1.5% whichever is the greatest.

The combination regrouping all the correct statements is: (1.00 P.)

[A] 2, 3, 4

[B] 3, 4

[C] 1, 2, 5

[D] 3, 5

- 69 When the pilot moves the mixture lever of a piston engine towards a lean position the: (1.00 P.)
- [A] amount of fuel entering the combustion chamber is increased.
  - [B] volume of air entering the carburettor is reduced.
  - [C] amount of fuel entering the combustion chamber is reduced.
  - [D] volume of air entering the carburettor is increased.

70 The advantages of fly-by-wire control are:

1. reduction of the electric and hydraulic power required to operate the control surfaces
2. lesser sensitivity to lightning strike
3. direct and indirect weight saving through simplification of systems
4. immunity to different interfering signals
5. improvement of piloting quality throughout the flight envelope

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 1 and 5
- [B] 3 and 5
- [C] 1 and 2
- [D] 3, 4 and 5



- 71 When altitude increases without adjustment of the mixture ratio, the piston engine performance is affected because of: (1.00 P.)
- [A] an increase of air density with a fuel flow which becomes too high.
  - [B] an increase of air density with a fuel flow which becomes too low.
  - [C] a decrease of air density with a fuel flow which becomes too low.
  - [D] a decrease of air density with a fuel flow which becomes too high.

- 72 The data supplied by a radio altimeter: (1.00 P.)
- [A] indicates the distance between the ground and the aircraft.
  - [B] concerns only the decision height.
  - [C] is used by the automatic pilot in the altitude hold mode.
  - [D] is used only by the radio altimeter indicator.

- 73 If the outside temperature at 35 000 feet is  $-40^{\circ}\text{C}$ , the local speed of sound is:  
(1.00 P.)
- [A] 247 kt.
  - [B] 307 kt.
  - [C] 595 kt.
  - [D] 686 kt.

- 74 An artificial feel unit is necessary in the pitch channel when: (1.00 P.)
- [A] there is a trimmable stabilizer.
  - [B] the elevators are fitted with servo-tabs or trim tabs.
  - [C] the elevators are actuated by reversible servo-control units.
  - [D] the elevators are actuated by irreversible servo-control units.

- 75 If one of the 12 cells of a lead-acid battery is dead, the battery: (1.00 P.)
- [A] has 1/12 less voltage and less capacity, but can still be used.
  - [B] has 1/12 less capacity, but can still be used.
  - [C] is unserviceable.
  - [D] has 1/12 less voltage, but can still be used.

- 76 The most common extinguishing agent used in gas turbine engine fire protection system is: (1.00 P.)
- [A] CO<sub>2</sub>.
  - [B] Freon.
  - [C] Water.
  - [D] Powder.

- 77 In order to produce an alternating voltage of 400 Hz, the number of pairs of poles required in an AC generator running at 6000 rpm is: (1.00 P.)
- [A] 8
  - [B] 4
  - [C] 12
  - [D] 24

78 Hydraulic fluids must have the following characteristics:

1. thermal stability
2. low emulsifying characteristics
3. corrosion resistant
4. good resistance to combustion
5. high compressibility
6. high volatility
7. high viscosity

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 1, 2, 5, 7
- [B] 1, 3, 4, 6
- [C] 2, 3, 4, 5
- [D] 1, 2, 3, 4



- 79 An inverter is a: (1.00 P.)
- [A] unit used to convert DC into AC.
  - [B] static discharger.
  - [C] filter against radio interference.
  - [D] device for reversing the polarity of the static charge.

- 80 The main purpose of a Constant Speed Drive unit is to: (1.00 P.)
- [A] take part in the balancing of reactive loads.
  - [B] mechanically protect the alternator drive shaft during coupling.
  - [C] take part in the voltage regulation.
  - [D] maintain a constant frequency.

- 81 Cabin pressure is controlled by: (1.00 P.)
- [A] delivering a substantially constant flow of air into the cabin and controlling the outflow.
  - [B] the cabin air mass flow control inlet valve(s).
  - [C] the cabin air re-circulation system.
  - [D] controlling the flow of air into the cabin with a constant outflow.

- 82 In a hydraulic braking system, an accumulator is pre-charged 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: (1.00 P.)
- [A] 1800 psi
  - [B] 1200 psi
  - [C] 3000 psi
  - [D] 4200 psi

83 When a part of a continuous loop 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: (1.00 P.)

[A] 1, 4

[B] 2, 3

[C] 2, 4

[D] 1, 3

- 84 In a hydraulic system overheat detectors are mostly installed: (1.00 P.)
- [A] at the coolers.
  - [B] at the actuators.
  - [C] in the reservoirs.
  - [D] at the pumps.

- 85 When changing power on engines equipped with constant-speed propeller, engine overload is avoided by: (1.00 P.)
- [A] adjusting Fuel Flow before the manifold pressure.
  - [B] increasing the RPM before increasing the manifold pressure.
  - [C] reducing the RPM before reducing the manifold pressure.
  - [D] increasing the manifold pressure before increasing the RPM.

- 86 The blade angle of a constant-speed propeller (1.00 P.)
- [A] decreases with increasing true air speed.
  - [B] increases with increasing true air speed.
  - [C] only varies with engine RPM.
  - [D] is independent of the true air speed.



87    Hydraulic fluids: (1.00 P.)

- [A]   Cause high fire risk.
- [B]   Are irritating to eyes and skin.
- [C]   Do not require special care.
- [D]   Are irritating to eyes and skin and cause high fire risk.

- 88 A propeller blade is twisted, so as to (1.00 P.)
- [A] decrease the blade tangential velocity from the blade root to the tip.
  - [B] avoid the appearance of sonic phenomena.
  - [C] allow a higher mechanical stress.
  - [D] keep the local Angle of Attack constant along the blade.

- 89 On most modern airliners the cabin pressure is controlled by regulating the: (1.00 P.)
- [A] Airflow leaving the cabin.
  - [B] Bleed air valve.
  - [C] RPM of the engine.
  - [D] Airflow entering the cabin.

90 Hydraulic fluids used in systems of large modern airliners are: (1.00 P.)

- [A] Vegetable base fluids.
- [B] Phosphate ester base fluids.
- [C] Water base fluids.
- [D] Mineral base fluids.

- 91 When increasing true airspeed with a constant engine RPM, the angle of attack of a fixed pitch propeller: (1.00 P.)
- [A] stays constant because it only varies with engine RPM.
  - [B] increases.
  - [C] reduces.
  - [D] stays constant.

- 92 Hydraulic power is a function of: (1.00 P.)
- [A] System pressure and tank capacity.
  - [B] System pressure and volume flow.
  - [C] Pump RPM only.
  - [D] Pump size and volume flow.

- 93 When TAS increases, the blade angle of a constant speed propeller will (RPM and throttle levers are not moved): (1.00 P.)
- [A] remain constant.
  - [B] first decrease and after a short time increase to its previous value.
  - [C] increase.
  - [D] decrease.

- 94 Large transport aeroplane hydraulic systems usually operate with a system pressure of approximately: (1.00 P.)
- [A] 2000 psi
  - [B] 4000 psi
  - [C] 3000 psi
  - [D] 1000 psi



- 95 The main advantage of a constant speed propeller as compared to a fixed pitch propeller is a: (1.00 P.)
- [A] constant efficiency in the whole speed range of the aeroplane.
  - [B] lower propeller blade stress.
  - [C] high efficiency in a much wider speed range of the aeroplane.
  - [D] higher efficiency in cruising range.
- 96 In case of engine failure during flight the blades of a constant speed propeller in a single engine aeroplane, not fitted with feathering system (1.00 P.)
- [A] move in low pitch position by oil pressure created by the windmilling propeller.
  - [B] move in the highest pitch position by the aerodynamic force.
  - [C] move in the lowest pitch position by the centrifugal force and/or the spring force.
  - [D] move in a certain pitch position depending on windmilling RPM.

- 97 In a modern hydraulic system, "hydraulic fuses" can be found. Their function is: (1.00 P.)
- [A] To switch to the secondary system in case of a leak in the primary brake system.
  - [B] To allow by-passing of a hydraulic pump in case it is subject to excessive pressure, without further damage to the system.
  - [C] To isolate a part of the system and protect it against accidental pollution.
  - [D] To prevent total system loss in case of a leaking hydraulic line.
- 98 In a hydraulic system, the reservoir is pressurized in order to: (1.00 P.)
- [A] prevent pump cavitation
  - [B] reduce fluid combustibility
  - [C] keep the hydraulic fluid at optimum temperature
  - [D] seal the system

- 99 Shuttle valves will automatically: (1.00 P.)
- [A] switch hydraulically operated units to the most appropriate pressure supply.
  - [B] reduce pump loads.
  - [C] guard systems against overpressure.
  - [D] shut down systems which are overloaded.
- 100 One of the functions of an accumulator in a hydraulic system is: (1.00 P.)
- [A] to store fluid.
  - [B] to damp pressure surges in the system.
  - [C] to act as a pressure relief valve.
  - [D] to store pressure.

101 For a given type of oil, the oil viscosity depends on the: (1.00 P.)

- [A] oil temperature.
- [B] quantity of oil.
- [C] oil pressure.
- [D] outside pressure.

- 102 If the cabin altitude rises (aircraft in level flight), the differential pressure: (1.00 P.)
- [A] increases
  - [B] may exceed the maximum permitted differential unless immediate preventative action is taken.
  - [C] decreases
  - [D] remains constant

103 Regarding fire detection, Ion detectors are used to detect: (1.00 P.)

- [A] fire.
- [B] overtemperature and fire.
- [C] smoke.
- [D] overtemperature.

- 104 The fuel supply system on a jet engine includes a fuel heating device, upstream of the main fuel filter so as to: (1.00 P.)
- [A] prevent, at low fuel temperature, the risk of ice formation from water contained in the fuel.
  - [B] ease low pressure pumps work by increasing fuel fluidity.
  - [C] maintain and improve fuel heating power.
  - [D] prevent fuel from freezing in fuel pipes due to low temperatures at high altitude.

105 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 pressure
4. balancing aircraft altitude with cabin altitude
5. cabin ventilation
6. keeping a constant differential pressure throughout all the flight phases.

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 5, 6, 1
- [B] 1, 2, 3
- [C] 2, 6, 4
- [D] 4, 5, 3



106 On the ground, the Auxiliary Power Unit (APU) can provide:

1. electricity
2. air for starting system
3. hydraulic pressure
4. air for air conditioning

The combination which regroups all of the correct statements is: (1.00 P.)

[A] 1, 2, 4.

[B] 1.

[C] 2, 3, 4.

[D] 1, 2, 3, 4.

- 107 During a normal pressurised climb after take-off: (1.00 P.)
- [A] the cabin differential pressure is maintained constant
  - [B] the pressurisation system is inoperative until an altitude of 10 000 feet is reached
  - [C] absolute cabin pressure increases to compensate for the fall in pressure outside the aircraft
  - [D] cabin pressure decreases more slowly than atmospheric pressure

108 020-002.jpg

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: (1.00 P.)

Siehe Anlage 2

- [A] FL 230
- [B] FL 280
- [C] FL 340
- [D] FL 180

- 109 When a landing gear wheel is hydroplaning, its friction factor is equal to: (1.00 P.)
- [A] 0
  - [B] 0.5
  - [C] 1
  - [D] 0.1

- 110 Main cabin temperature is: (1.00 P.)
- [A] controlled automatically, or by flight crew selection.
  - [B] not controllable at the maximum cabin differential pressure.
  - [C] controlled by individual passenger.
  - [D] Only controllable at maximum cabin differential pressure.

111 A thermal circuit breaker: (1.00 P.)

- [A] uses electromagnetic trip system to prevent over heating.
- [B] limits any overcurrent.
- [C] protects the system in the event of overload/overheating.
- [D] can be re-engaged without any danger even if the fault remains.

- 112 The Auxiliary Power Unit (APU) has its own AC generator that: (1.00 P.)
- [A] is driven at constant speed through a Constant Speed Drive (CSD), in the same way as the main AC generator.
  - [B] must have the same characteristics as the main AC generator so that it can be easily coupled with the latter.
  - [C] supplies the aircraft with three-phase 115-200 V, 400 Hz AC.
  - [D] is excited by its Generator Control Unit (GCU) as soon as the APU starts up.

- 113 The purpose of cabin air flow control valves in a pressurization system is to: (1.00 P.)
- [A] regulate cabin pressure at the maximum cabin pressure differential.
  - [B] regulate cabin pressure to the selected altitude.
  - [C] Maintain a constant and sufficient mass air flow to ventilate the cabin and minimise cabin pressure surges.
  - [D] discharge cabin air to atmosphere if cabin pressure rises above the selected altitude.
- 114 Assuming cabin differential pressure has reached the required value in normal flight conditions, if flight altitude and air conditioning system setting are maintained: (1.00 P.)
- [A] the outflow valves will move to the fully closed position.
  - [B] the mass air flow through the cabin is constant.
  - [C] the pressurisation system ceases to function until leakage reduces the pressure.
  - [D] the outflow valves will move to the fully open position.

115 The colour of a fresh synthetic hydraulic fluids is: (1.00 P.)

- [A] blue.
- [B] purple.
- [C] red.
- [D] pink.



116 A magnetic circuit-breaker is: (1.00 P.)

- [A] can be reset without any danger even when fault remains.
- [B] a protection system that has a quick tripping response.
- [C] permits an overcurrent limited in time.
- [D] is a system with a slow response time.

117 The gyroscope of a turn indicator has:

(NB: the degree(s) of freedom of a gyro does not take into account its rotor spin axis.) (1.00 P.)

- [A] 0 degree of freedom.
- [B] 1 degree of freedom.
- [C] 3 degrees of freedom.
- [D] 2 degrees of freedom.

- 118 During level flight at a constant cabin pressure altitude (which could be decreased, even at this flight level), the cabin outflow valves are: (1.00 P.)
- [A] Fully closed until the cabin descends to a selected altitude.
  - [B] At the pre-set position for take-off.
  - [C] Partially open.
  - [D] fully closed until the cabin climbs to a selected altitude.

119 Cabin air for a large airplane, during flight: (1.00 P.)

- [A] is temperature controlled.
- [B] has an increased oxygen ratio.
- [C] has a reduced oxygen ratio.
- [D] has a constant oxygen ratio regulated to a preset value.

120 The cabin pressure is regulated by the: (1.00 P.)

- [A] Cabin inlet airflow valve.
- [B] Air cycle machine.
- [C] Outflow valve.
- [D] Air conditioning pack.

121 The fields affecting a magnetic compass originate from:

1. magnetic masses
2. ferrous metal masses
3. non ferrous metal masses
4. electrical currents

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 1, 2, 3
- [B] 1, 2, 3, 4
- [C] 1, 3, 4
- [D] 1, 2, 4

- 122 Modern low altitude radio altimeters emit waves in the following frequency band:  
(1.00 P.)
- [A] VLF (Very Low Frequency).
  - [B] HF (High Frequency).
  - [C] SHF (Super High Frequency).
  - [D] UHF (Ultra High Frequency).

123 The Primary Flight Display (PFD) displays information dedicated to: (1.00 P.)

- [A] piloting.
- [B] weather situation.
- [C] systems.
- [D] engines and alarms.



- 124 Under normal conditions the cabin pressure altitude is not allowed to exceed:  
(1.00 P.)
- [A] 6000 ft
  - [B] 8000 ft
  - [C] 4000 ft
  - [D] 10000 ft

- 125 In jet transport aircraft, breathing oxygen for the cockpit is stored in the following state: (1.00 P.)
- [A] chemical or gaseous.
  - [B] liquid.
  - [C] gaseous.
  - [D] chemical.

- 126 On board present aircraft, the batteries used are mainly Cadmium-Nickel. Their advantages are:
1. low risk of thermal runaway
  2. high internal resistance, hence higher power
  3. good charging and discharging capability at high rating
  4. wider permissible temperature range
  5. good storage capability
  6. sturdiness owing to its metal casing
  7. the electrolyte density remains unchanged during charging.

The combination of correct statement is: (1.00 P.)

- [A] 2, 3, 4, 5, 6
- [B] 1, 2, 5, 6, 7
- [C] 3, 4, 6, 7
- [D] 3, 4, 5, 6

- 127 Cabin altitude means the: (1.00 P.)
- [A] cabin pressure expressed as altitude.
  - [B] flight level altitude at maximum differential pressure.
  - [C] flight level the aircraft is flying at.
  - [D] difference in height between the cabin floor and ceiling.
- 128 On a modern large pressurized transport aircraft, the maximum cabin differential pressure is approximately: (1.00 P.)
- [A] 3 - 5 psi
  - [B] 22 psi
  - [C] 13 - 15 psi
  - [D] 7 - 9 psi

- 129 The operating frequency range of a radio altimeter is: (1.00 P.)
- [A] 5400 MHz or 9400 MHz.
  - [B] 4200 MHz to 4400 MHz.
  - [C] 2700 MHz to 2900 MHz.
  - [D] 5 GHz.

130 Shimmy occurs on the nose wheel landing gear during taxiing when:

1. the wheels tend to describe a sinusoidal motion on the ground
2. the wheels no longer respond to the pilot's actions

This effect is overcome by means of:

3. the torque link
4. a damper associated with the steering cylinder

The combination of correct statements is: (1.00 P.)

- [A] 2, 3.
- [B] 2, 4.
- [C] 1, 4.
- [D] 1, 3.

- 131 If the maximum operating altitude of an airplane is limited by the pressurized cabin, this limitation is due to the maximum: (1.00 P.)
- [A] Negative differential pressure at maximum cabin altitude.
  - [B] Negative cabin differential pressure at maximum operating ceiling.
  - [C] Positive cabin differential pressure at maximum operating ceiling.
  - [D] Positive cabin differential pressure at maximum cabin altitude.

- 132 When flying in cold air (colder than standard atmosphere), the altimeter will:  
(1.00 P.)
- [A] be just as correct as before.
  - [B] show the actual height above ground.
  - [C] overread
  - [D] underread



133 During descent, the total pressure probe of the airspeed indicator becomes blocked. In this case:

- 1 - IAS becomes greater than CAS
- 2 - IAS becomes lower than CAS
- 3 - maintaining IAS constant, VMO may be exceeded
- 4 - maintaining IAS constant, aircraft may stall

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 2, 4.
- [B] 2, 3.
- [C] 1, 4.
- [D] 1, 3.

- 134 The "cabin differential pressure" is: (1.00 P.)
- [A] approximately 15 psi at maximum.
  - [B] cabin pressure minus ambient pressure.
  - [C] the pressure differential between the air entering and leaving the cabin.
  - [D] approximately 5 psi at maximum.
- 135 The cabin rate of descent: (1.00 P.)
- [A] results in a cabin pressure decrease.
  - [B] results in a cabin pressure increase.
  - [C] is always the same as the airplane's rate of descent.
  - [D] is not possible at constant airplane altitudes.

- 136 The output of a generator is controlled by: (1.00 P.)
- [A] the reverse current relay circuit breaker.
  - [B] varying the speed of the engine.
  - [C] varying the field strength.
  - [D] varying the length of wire in the armature windings.

137 The rating of electrical fuses is expressed in: (1.00 P.)

[A] amperes.

[B] watts.

[C] volts.

[D] ohms.

- 138 The maximum cabin differential pressure of a pressurised aeroplane operating at FL370 is approximately: (1.00 P.)
- [A] 3.5 psi
  - [B] 15.5 psi
  - [C] 13.5 psi
  - [D] 9.0 psi

139 The capacity of a battery is given in: (1.00 P.)

[A] Ampere hours.

[B] Ohms.

[C] Watts.

[D] Amperes/volts.

140 In standard atmosphere, when climbing at constant CAS: (1.00 P.)

- [A] TAS and Mach number decrease.
- [B] TAS decreases and Mach number increases.
- [C] TAS increases and Mach number decreases.
- [D] TAS and Mach number increase.

- 141 The purpose of the pack cooling fans in the air conditioning system is to: (1.00 P.)
- [A] supply the heat exchangers with cooling air during cruise flight.
  - [B] cool the APU compartment.
  - [C] supply the heat exchangers with cooling air during slow flights and ground operation.
  - [D] supply the Passenger Service Unit (PSU) with fresh air.



142 The limits of the yellow scale of an airspeed indicator are: (1.00 P.)

- [A] VLO for the lower limit and VNE for the upper limit
- [B] VLE for the lower limit and VNE for the upper limit
- [C] VFE for the lower limit and VNE for the upper limit
- [D] VNO for the lower limit and VNE for the upper limit

- 143 In flight, the cabin air for modern airplanes with jet engines is usually supplied by: (1.00 P.)
- [A] piston compressors.
  - [B] ram air intakes.
  - [C] single radial compressors.
  - [D] engine compressors.

144 The limits of the green scale of an airspeed indicator are: (1.00 P.)

- [A] VS0 for the lower limit and VNO for the upper limit
- [B] VS1 for the lower limit and VLO for the upper limit
- [C] VS1 for the lower limit and VNE for the upper limit
- [D] VS1 for the lower limit and VNO for the upper limit

- 145 Cabin air for modern aircraft is usually taken from: (1.00 P.)
- [A] the low pressure compressor.
  - [B] the low pressure compressor and from the high pressure compressor if necessary.
  - [C] the second fan stage.
  - [D] the high pressure compressor.
- 146 In an aircraft air conditioning system the air cannot be treated for: (1.00 P.)
- [A] pressure.
  - [B] humidity.
  - [C] purity.
  - [D] temperature.

147 The limits of the white scale of an airspeed indicator are: (1.00 P.)

- [A] VSO for the lower limit and VFE for the upper limit
- [B] VSI for the lower limit and VLE for the upper limit
- [C] VSO for the lower limit and VLE for the upper limit
- [D] VSI for the lower limit and VFE for the upper limit

148 The 'slipstream effect' of a propeller is most prominent at: (1.00 P.)

- [A] high airspeeds with high power setting.
- [B] low airspeeds with high power setting.
- [C] low airspeeds with low power setting.
- [D] high airspeeds with low power setting.

- 149 The limit speed maximum operating (VMO) is a speed expressed as: (1.00 P.)
- [A] equivalent airspeed (EAS).
  - [B] true airspeed (TAS).
  - [C] calibrated airspeed (CAS).
  - [D] computed airspeed (COAS).

- 150 Generally, for large aeroplanes, electrical heating for ice protection is used on:  
(1.00 P.)
- [A] fin leading edges.
  - [B] elevator leading edges.
  - [C] pitot tubes.
  - [D] slat leading edges.



- 151 An asymmetric loading (p-factor) on the propeller exists .. (1.00 P.)
- [A] If there is an unbalanced propeller.
  - [B] Only for counterrotating propeller
  - [C] If the aeroplane has a large angle of attack.
  - [D] Only if the 'constant speed propeller' mechanism is broken.
- 152 In respect of a constant speed propeller of a twin engine aeroplane controlled by a single-acting pitch control unit: (1.00 P.)
- [A] oil pressure turns the propeller blades towards smaller pitch angle.
  - [B] oil pressure turns the propeller blades towards higher pitch angle.
  - [C] spring force turns the propeller blades towards smaller pitch angle.
  - [D] aerodynamic force turns the propeller blades towards higher pitch angle.

- 153 After an aircraft has passed through a volcanic cloud which has blocked the total pressure probe inlet of the airspeed indicator, the pilot begins a stabilized descent and finds that the indicated airspeed: (1.00 P.)
- [A] increases abruptly towards VNE
  - [B] decreases steadily
  - [C] decreases abruptly towards zero
  - [D] increases steadily

- 154 The principle of the Mach indicator is based on the computation of the ratio: (1.00 P.)
- [A]  $(P_t - P_s)/P_t$
  - [B]  $(P_t - P_s)/P_s$
  - [C]  $P_t/P_s$
  - [D]  $(P_t + P_s)/P_s$

- 155 On most transport aircraft, the low pressure pumps of the fuel system are: (1.00 P.)
- [A] electro-mechanical wobble pumps, with self-regulated pressure.
  - [B] removable only after the associated tank has been emptied.
  - [C] centrifugal pumps, driven by an electric motor.
  - [D] mechanically driven by the engine's accessory gearbox.

- 156 The mach number is the: (1.00 P.)
- [A] true airspeed (TAS) divided by the local speed of sound
  - [B] corrected airspeed (CAS) divided by the local speed of sound
  - [C] equivalent airspeed (EAS) divided by the local speed of sound
  - [D] indicated airspeed (IAS) divided by the local speed of sound

- 157 On most transport jet aircraft, the low pressure pumps of the fuel system are supplied with electric power of the following type: (1.00 P.)
- [A] 28 V AC
  - [B] 28 V DC
  - [C] 115 V DC
  - [D] 115 V AC

- 158 During a climb, the total pressure probe of the airspeed indicator becomes blocked; if the pilot maintains a constant indicated airspeed, the true airspeed: (1.00 P.)
- [A] decreases until reaching the stall speed.
  - [B] increases until reaching VMO.
  - [C] decreases by 1% per 600 FT.
  - [D] increases by 1% per 600 FT.
- 159 With constant weight and configuration, an aircraft always takes off at the same: (1.00 P.)
- [A] indicated airspeed.
  - [B] equivalent airspeed.
  - [C] true airspeed.
  - [D] ground speed.

- 160 The pressure usually produced by the Boost Pumps (BP) of the fuel supply system of a large jet transport airplane is within the following range: (1.00 P.)
- [A] 20 to 50 psi
  - [B] 3000 to 5000 psi
  - [C] 5 to 10 psi
  - [D] 300 to 500 psi



- 161 The indication of the directional gyro is valid only for a limited period of time.  
The causes of this inaccuracy are:

- 1 - rotation of the earth
- 2 - longitudinal accelerations
- 3 - aircraft's moving over the surface of the earth
- 4 - mechanical imperfections
- 5 - vertical components of the earth's magnetic field
- 6 - geometry of the gimbal system

The combination regrouping all the correct statements is: (1.00 P.)

- [A] 1,3,4,6
- [B] 1,2,4,6.
- [C] 1,2,3,4,6.
- [D] 2,3,5.

- 162 In a gas turbine engine lubrication system, the oil to fuel heat exchanger provides: (1.00 P.)
- [A] oil cooling through thermal exchange with the fuel.
  - [B] automatic controlled fuel heating by engine oil to prevent icing in the fuel filter.
  - [C] fuel cooling to prevent vapour locking interrupting the fuel supply to the nozzles.
  - [D] fuel heating as required whenever fuel filter clogging is detected.

163 The artificial horizon uses a gyroscope with:

(note: the degree(s) of freedom of a gyro does not take into account its rotor spin axis.) (1.00 P.)

- [A] one degree of freedom, and its rotor spin axis is continuously maintained in the horizontal plane by an automatic erecting system.
- [B] one degree of freedom, and its rotor spin axis is continuously maintained to local vertical by an automatic erecting system.
- [C] two degrees of freedom, and its rotor spin axis is continuously maintained to local vertical by an automatic erecting system.
- [D] two degrees of freedom, and its rotor spin axis is continuously maintained in the horizontal plane by an automatic erecting system.

164 The fuel cross-feed system: (1.00 P.)

- [A] is only used in flight for fuel transfer from one tank to another.
- [B] allows feeding of any engine from any fuel tank.
- [C] is only used to feed an engine from the tank of the opposite wing.
- [D] is only used on the ground for fuel transfer from one tank to another.

- 165 The characteristics of the directional gyro used in a gyro stabilised compass system are:

NB: the degree(s) of freedom of a gyro does not take into account its rotor spin axis. (1.00 P.)

- [A] two degrees of freedom, whose axis aligned with the vertical to the location is maintained in this direction by an erecting system.
- [B] one degree of freedom, whose vertical axis, aligned with the real vertical to the location is maintained in this direction by an automatic erecting system.
- [C] two degrees of freedom, whose horizontal axis corresponding to the reference direction is maintained in the horizontal plane by an automatic erecting system.
- [D] one degree of freedom, whose horizontal axis is maintained in the horizontal plane by an automatic erecting system.

166 The purpose of baffles in an aeroplane's integral fuel tank is to: (1.00 P.)

- [A] prevent overpressure in the tank.
- [B] restrict the fuel movements in the tank.
- [C] prevent mixture of the fuel and hydraulic fluid.
- [D] prevent the fuel from flowing in the vent lines.

- 167 Calibrated Air Speed (CAS) is obtained from Indicated Air Speed (IAS) by correcting for the: (1.00 P.)
- [A] instrument error.
  - [B] density error.
  - [C] position and density errors.
  - [D] position and instrument errors.

168 On a transport type aircraft the fuel tank system is vented through: (1.00 P.)

- [A] Ram air scoops on the underside of the wing.
- [B] The return lines of the fuel pumps.
- [C] Bleed air from the engines.
- [D] A pressure regulator in the wing tip.



169 VNO is the maximum speed: (1.00 P.)

- [A] with flaps extended in landing position.
- [B] which must never be exceeded.
- [C] not to be exceeded except in still air and with caution.
- [D] at which the flight controls can be fully deflected.

170 The types of fuel tanks used on most modern transport aircraft are: (1.00 P.)

- [A] Cell tanks.
- [B] Integral tanks.
- [C] Fixed built-in tanks.
- [D] Combined fuel tanks.

- 171 VNE is the maximum speed: (1.00 P.)
- [A] which must never be exceeded
  - [B] not to be exceeded except in still air and with caution
  - [C] with flaps extended in landing position
  - [D] at which the flight controls can be fully deflected

172 The purpose of baffle check valves fitted in aircraft fuel tanks is to: (1.00 P.)

- [A] prevent fuel movement to the wing tip.
- [B] damp out movement of the fuel in the tank.
- [C] prevent positive pressure build up inside the tank.
- [D] close the vent lines in case of turbulence.

- 173 On most transport aircraft, the low pressure pumps of the fuel system are: (1.00 P.)
- [A] Gear type pumps.
  - [B] Piston pumps.
  - [C] Centrifugal pumps.
  - [D] Diaphragm pumps.

174 VLO is the maximum: (1.00 P.)

- [A] speed at which the landing gear can be operated with full safety.
- [B] flight speed with landing gear down.
- [C] cruising speed not to be exceeded except in still air with caution.
- [D] speed with flaps extended in a given position.

- 175 For take-off, the correct combination of propeller pitch (1), and propeller lever position (2) at brake release is: (1.00 P.)
- [A] (1) low (2) aft.
  - [B] (1) high (2) forward.
  - [C] (1) high (2) aft.
  - [D] (1) low (2) forward.

176 The pressurization of fuel tanks is maintained by: (1.00 P.)

- [A] the fuel tank drains.
- [B] the fuel top off unit.
- [C] the fuel vent system.
- [D] the fuel dump system.



- 177 For piston engines, mixture ratio is the ratio between the: (1.00 P.)
- [A] volume of fuel and volume of air entering the cylinder.
  - [B] volume of fuel and volume of air entering the carburettor.
  - [C] mass of fuel and mass of air entering the cylinder.
  - [D] mass of fuel and volume of air entering the carburettor.

178 VLE is the maximum: (1.00 P.)

- [A] speed with flaps extended in a given position
- [B] speed authorized in flight
- [C] speed at which the landing gear can be operated with full safety
- [D] flight speed with landing gear down

- 179 Variations in mixture ratios for carburettors are achieved by the adjustment of:  
(1.00 P.)
- [A] fuel flow.
  - [B] fuel flow and air flow.
  - [C] air flow.
  - [D] fuel flow, air flow and temperature.

- 180 In a turbo compressor air conditioning system (bootstrap system), the purpose of the heat exchangers is to: (1.00 P.)
- [A] allow a homogeneous temperature by mixing air flows from various air conditioning groups in operation.
  - [B] cool the bleed air in front and behind the compressor of the air cycle machine.
  - [C] allow a steady compressor outlet temperature.
  - [D] cool bleed air before entering the complete pneumatic system.

- 181 The position error of the static vent on which the altimeter is connected varies substantially with the: (1.00 P.)
- [A] static temperature.
  - [B] flight time at high altitude.
  - [C] Mach number of the aircraft.
  - [D] deformation of the aneroid capsule.
- 182 When flying in cold air (colder than standard atmosphere), indicated altitude is: (1.00 P.)
- [A] the same as the true altitude.
  - [B] lower than the true altitude.
  - [C] equal to the standard altitude.
  - [D] higher than the true altitude.

- 183 In a turbo compressor air conditioning system (bootstrap system), the main water separation unit is: (1.00 P.)
- [A] before the heat exchangers.
  - [B] after the cooling turbine.
  - [C] just after the heat exchangers.
  - [D] before the cooling turbine.

- 184 When flying in warm air (warmer than standard atmosphere), indicated altitude is:  
(1.00 P.)
- [A] higher than the true altitude.
  - [B] lower than the true altitude.
  - [C] equal to the standard altitude.
  - [D] the same as the true altitude.

185 A turbo compressor air conditioning system (bootstrap system) includes two heat exchangers; the primary exchanger (P) and the secondary exchanger (S).

The functions of these heat exchangers are as follows: (1.00 P.)

- [A] P: warms up engine bleed air  
S: increases the temperature of air originating from the compressor of the pack.
- [B] P: pre-cools the engine bleed air  
S: increases the temperature of the air used for air-conditioning of cargo compartment (animals).
- [C] P: warms up engine bleed air  
S: recirculates the cabin air, reducing its temperature.
- [D] P: precools the engine bleed air  
S: cools air behind the pack's compressor.



- 186 A mixture setting richer than best power has to be used during climb segments. This results in a (1.00 P.)
- [A] higher torque.
  - [B] increase of power.
  - [C] lower cylinder head temperature.
  - [D] higher efficiency.

187 Due to its conception, the altimeter measures a: (1.00 P.)

- [A] a temperature altitude
- [B] a true altitude
- [C] a density altitude
- [D] a pressure altitude

- 188 When air is compressed for pressurization purposes, the percentage oxygen content is: (1.00 P.)
- [A] dependent on the degree of pressurisation.
  - [B] increased.
  - [C] unaffected.
  - [D] decreased.

- 189 The density altitude is: (1.00 P.)
- [A] the pressure altitude corrected for the density of air at this point
  - [B] the pressure altitude corrected for the relative density prevailing at this point
  - [C] the altitude in the standard atmosphere on which the density is equal to the actual density of the atmosphere
  - [D] the temperature altitude corrected for the difference between the real temperature and the standard temperature
- 190 The pressure altitude is the altitude corresponding: (1.00 P.)
- [A] in ambient atmosphere, to the reference pressure  $P_s$ .
  - [B] in standard atmosphere, to the reference pressure  $P_s$ .
  - [C] in standard atmosphere, to the pressure  $P_s$  prevailing at this point.
  - [D] in ambient atmosphere, to the pressure  $P_s$  prevailing at this point.

- 191 The term "bootstrap", when used to identify a cabin air conditioning and pressurisation system, refers to the: (1.00 P.)
- [A] source of the charge air.
  - [B] charge air across the inter-cooler heat exchanger.
  - [C] means by which pressurisation is controlled.
  - [D] cold air unit (air cycle machine) arrangement.
- 192 In a turbo compressor air conditioning system (bootstrap system) the supply of air behind the primary heat exchanger is: (1.00 P.)
- [A] compressed, then passed across an expansion turbine and finally across a heat exchanger.
  - [B] passed across an expansion turbine, then directly to the heat exchanger.
  - [C] passed across an expansion turbine, compressed and then passed through a heat exchanger.
  - [D] compressed, passed through a heat exchanger, and then across an expansion turbine.

- 193 During a deceleration phase at constant attitude, the control system of the artificial horizon results in the horizon bar indicating a (1.00 P.)
- [A] nose down attitude.
  - [B] constant attitude.
  - [C] nose up followed by a nose down attitude.
  - [D] nose up attitude.

- 194 In a cabin air conditioning system, equipped with a bootstrap, the mass air flow is routed via the: (1.00 P.)
- [A] secondary heat exchanger outlet to the compressor inlet of the cold air unit.
  - [B] turbine outlet of the cold air unit to the primary heat exchanger inlet.
  - [C] compressor outlet of the cold air unit to the primary heat exchanger inlet.
  - [D] secondary heat exchanger outlet to the turbine inlet of the cold air unit.

- 195 When an aircraft has turned 360 degrees with a constant attitude and bank, the pilot observes the following on a classic artificial horizon: (1.00 P.)
- [A] too much nose-up and bank too low
  - [B] too much nose-up and bank too high
  - [C] attitude and bank correct
  - [D] too much nose-up and bank correct
- 196 When an aircraft has turned 90 degrees with a constant attitude and bank, the pilot observes the following on a classic artificial horizon: (1.00 P.)
- [A] attitude and bank correct
  - [B] too much nose-up and bank too high
  - [C] too much nose-up and bank correct
  - [D] too much nose-up and bank too low



- 197 Engine bleed air used for air conditioning and pressurization in turbo-jet aeroplanes is usually taken from the: (1.00 P.)
- [A] by-pass ducting.
  - [B] compressor section.
  - [C] turbine section.
  - [D] fan section.

- 198 A gravity type erector is used in a vertical gyro device to correct errors on: (1.00 P.)
- [A] a directional gyro unit
  - [B] a turn indicator
  - [C] a gyromagnetic indicator
  - [D] an artificial horizon

199 In an air cycle machine: (1.00 P.)

- [A] the turbine drives the compressor which provides pressurisation.
- [B] the temperature drop across the turbine is the main contributor to the cooling effect of the air cycle machine.
- [C] the turbine increases the pressure of the air supply to the cabin.
- [D] the turbine drives the compressor of the machine which causes a higher temperature, and so increases the second heat exchanger efficiency.

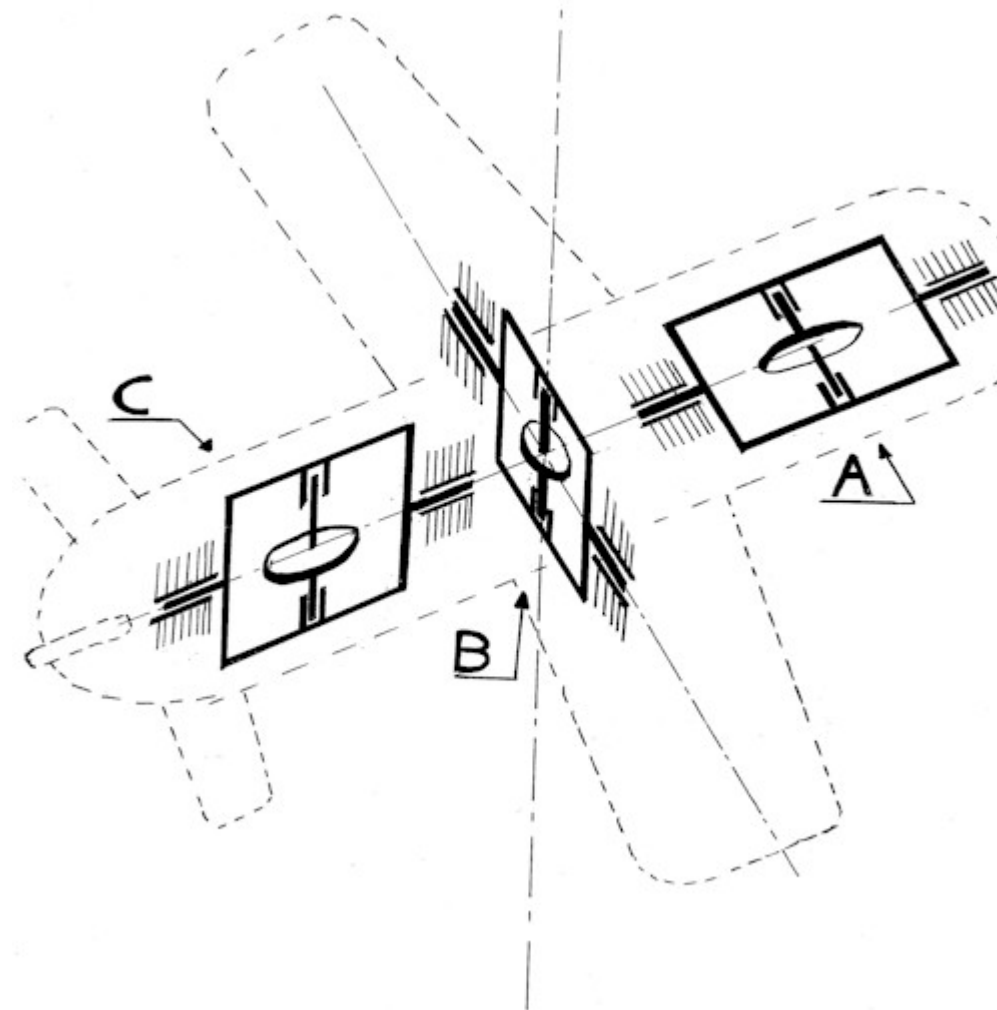
- 200 The latitude at which the apparent wander of a directional gyro is equal to 0 is:  
(1.00 P.)
- [A] the equator
  - [B] latitude  $45^\circ$
  - [C] the North pole
  - [D] latitude  $30^\circ$

## Anlagen zu den Aufgaben

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Anlage 1 zu Aufgabe 38

Titel: Anlage 1



Anlage 2 zu Aufgabe 108

Titel: Anlage 1

# Anlagen zu den Aufgaben

B. 747 TU		Conduif du vol		Performances generalites				62. 20. 05					
AIR FRANCE DO.NT		ATMOSPHERE STANDARD										FEV. 84	
ALTITUDE Pieds	TEMPERATURE		PRESSION				RAPPORT de PRESSION $\delta = P / P_0$	IDENSITE RELATIVE $\delta = \rho / \rho_0$	$\sqrt{\text{DENSITE}}$	VITESSE du SON (a) kt	ALTITUDE Metres		
	°C	° F	mb	P S I	In Hg	mm Hg							
45.000	- 56,5	- 69,7	147	2,14	4,36	110,7	0,1415	0.1936	0,440	574	13. 716		
44.000	- 56,5	- 69,7	155	2,24	4,57	116,0	0,1527	0.2031	0,451	574	13. 411		
43.000	- 56,5	- 69,7	162	2,35	4,79	121,7	0,1602	0,2131	0,462	574	13. 106		
42.000	- 56,5	- 69,7	170	2,47	5,03	127,8	0,1681	0,2236	0,473	574	12. 802		
41.000	- 56,5	- 69,7	179	2,19	5,28	134,1	0,1764	0.2346	0,484	574	12. 497		
40.000	- 56,5	- 69,7	188	2,72	5,54	140,7	0,1851	0,2462	0.496	574	12. 192		
39.000	- 56,5	- 69,7	197	2,81	5,81	147,6	0,1942	0,2583	0,508	574	11. 887		
38.000	- 56,5	- 69,7	206	2,99	6,10	154,9	0,2018	0,2710	0,521	574	11. 582		
37.000	- 56,5	- 69,7	217	3,14	6,40	162,6	0,2138	0,2843	0,533	574	11. 278		
36.000	- 56,3	- 69,4	227	3,30	6,71	170,4	0,2243	0,2981	0,546	574	10. 973		
35.000	- 54,3	- 65,8	238	3,46	7,04	178,8	0,2353	0,3099	0,557	576	10. 668		
34.000	- 52,4	- 62,3	250	3,63	7,38	187,5	0,2467	0,3220	0,569	579	10. 363		
33.000	- 50,4	- 58,7	262	3,80	7,74	196,6	0,2586	0.3345	0,578	582	10. 058		
32.000	- 48,4	- 55,1	274	3,98	8,11	206,0	0,2709	0.3473	0,589	584	9. 754		
31.000	- 46,4	- 51,6	287	4,17	8,49	215,6	0,2837	0.3605	0,600	587	9. 449		
30.000	- 44,4	- 48,0	301	4,36	8,89	225,8	0,2970	0,3741	0,611	589	9. 144		
29.000	- 42,5	- 44,4	315	4,57	9,30	236,2	0,3107	0,3881	0,623	591	8. 839		
28.000	- 40,5	- 40,9	329	4,78	9,73	247,1	0,3250	0,4025	0,634	594	8. 534		
27.000	- 38,5	- 37,3	344	4,99	10,17	258,3	0,3398	0,4173	0,646	597	8. 230		
26.000	- 36,5	- 33,7	360	5,22	10,63	270,0	0,3552	0,4325	0,658	599	7. 925		
25.000	- 34,5	- 30,2	376	5,45	11,10	281,9	0,3711	0,4481	0,669	602	7. 620		
24.000	- 32,5	- 26,6	393	5,70	11,60	294,6	0,3876	0,4642	0,681	604	7. 315		
23.000	- 30,6	- 23,0	410	5,95	12,11	307,6	0,4047	0,4806	0,693	607	7. 010		
22.000	- 28,6	- 19,5	428	6,21	12,64	321,1	0,4223	0,4976	0,705	609	6. 706		
21.000	- 26,6	- 15,9	446	6,47	13,18	334,8	0,4406	0,5150	0,718	612	6. 401		
20.000	- 24,6	- 12,3	466	6,75	13,75	349,3	0,4596	0,5328	0,730	614	6. 096		
19.000	- 22,6	- 8,8	485	7,04	14,34	364,2	0,4791	0,5511	0,742	617	5. 791		
18.000	- 20,7	- 5,2	506	7,34	14,94	379,5	0,4994	0,5699	0,755	619	5. 486		
17.000	- 18,7	- 1,6	527	7,65	15,57	395,5	0,5203	0,5892	0,768	622	5. 182		
16.000	- 16,7	+ 1,9	549	7,97	16,22	412,0	0,5420	0,6089	0,780	624	4. 877		
15.000	- 14,7	+ 5,5	572	8,29	16,89	429,0	0,5644	0,6292	0,793	626	4. 572		
14.000	- 12,7	+ 9,1	595	8,63	17,58	446,1	0,5875	0,6500	0,806	629	4. 267		
13.000	- 10,7	+ 12,6	619	8,99	18,29	464,6	0,6113	0,6713	0,819	631	3. 962		
12.000	- 8,8	+ 16,2	644	9,35	19,03	483,4	0,6360	0,6932	0,833	634	3. 658		
11.000	- 6,8	+ 19,8	670	9,72	19,79	502,7	0,6614	0,7155	0,846	636	3. 353		
10.000	- 4,8	+ 23,3	697	10,11	20,58	522,7	0,6877	0,7385	0,859	638	3. 048		
9.000	- 2,8	+ 26,9	724	10,50	21,39	543,3	0,7148	0,7619	0,873	641	2. 743		
8.000	- 0,8	+ 30,5	753	10,92	22,23	564,6	0,7428	0,7860	0,887	643	2. 438		
7.000	+ 1,1	+ 34,0	782	11,34	23,09	586,5	0,7716	0,8106	0,900	645	2. 134		
6.000	+ 3,1	+ 37,6	812	11,78	23,98	609,1	0,8014	0,8358	0,914	648	1. 829		
5.000	+ 5,1	+ 41,2	843	12,23	24,90	632,5	0,8321	0,8616	0,928	650	1. 524		
4.000	+ 7,1	+ 44,7	875	12,69	25,84	656,3	0,8037	0,8881	0,942	652	1. 219		
3.000	+ 9,1	+ 48,3	908	13,17	26,82	681,2	0,8962	0,9151	0,957	655	914		
2.000	+ 11,0	+ 51,9	942	13,66	27,82	706,6	0,9298	0,9427	0,971	657	610		
1.000	+ 13,0	+ 55,4	977	14,17	28,86	733,0	0,9644	0,9710	0,985	659	305		
0	+ 15,0	+ 59,0	1013	14,70	29,92	760,0	1,0000	1,0000	1,000	661	0		
1.000	+ 17,0	+ 62,5	1050	15,23	31,02	787,9	1,0366	1,0295	1,015	664	-305		

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# Nur für den internen Gebrauch

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84.				D
87.		B		
90.		B		
93.			C	
96.			C	
99.	A			
102.			C	
105.		B		
108.	A			
111.			C	
114.		B		
117.		B		
120.			C	
123.	A			
126.				D
129.		B		
132.			C	

# Nur für den internen Gebrauch

LÖSUNGSBOGEN

Prüf.-Nr.:

Prüfungsdatum:

133 .		B		
136 .			C	
139 .	A			
142 .				D
145 .		B		
148 .		B		
151 .			C	
154 .		B		
157 .				D
160 .	A			
163 .			C	
166 .		B		
169 .			C	
172 .	A			
175 .				D
178 .				D
181 .			C	
184 .		B		
187 .				D
190 .			C	
193 .	A			
196 .				D
134 .		B		
137 .	A			
140 .				D
143 .				D
146 .		B		
149 .			C	
152 .	A			
155 .			C	
158 .	A			
161 .	A			
164 .		B		
167 .				D
170 .		B		
173 .			C	
176 .			C	
179 .	A			
182 .				D
185 .				D
188 .			C	
191 .				D
194 .				D
197 .		B		
135 .		B		
138 .				D
141 .			C	
144 .				D
147 .	A			
150 .			C	
153 .		B		
156 .	A			
159 .		B		
162 .	A			
165 .			C	
168 .	A			
171 .	A			
174 .	A			
177 .			C	
180 .		B		
183 .		B		
186 .			C	
189 .			C	
192 .				D
195 .			C	
198 .				D

<b>Nur für den internen Gebrauch</b>	
<b>LÖSUNGSBOGEN</b>	<b>Prüf.-Nr.:</b>
<b>Prüfungsdatum:</b>	

<b>199</b> .				<b>D</b>		<b>200</b> .	<b>A</b>			
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