

1. DURALUMIN alloys:

1 have an aluminum-copper base.

~~2 have an aluminum-magnesium base.~~

~~3 are easy to weld.~~

4 are difficult to weld.

5 have a good thermal conductivity.

~~6 have a poor air corrosion resistance~~

The combination regrouping all the correct statements is:

**1,4,5**

2. 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 components

6 The failure of a member causes the loads to be shared between the other system components.

The combination regrouping all the correct statements is:

**1,5,6**

3. The fuselage of an aircraft consists, among others, of stringers whose purpose is to:

**Assist the skin in absorbing the longitudinal traction-compression stresses**

4. Among the different types of aircraft structures, the shell structures efficiently transmit the:

1. normal bending stresses

~~2. tangent bending stresses~~

3. torsion moment

4. shear stresses

The combination regrouping all the correct statements is :

**1, 3, 4**

5. 'Fail safe construction' is:

**A type of construction in which the load is carried by other components if a part of the structure fails**

6. 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

**The lifetime of the fatigue sensitive parts has been based on a determined load spectrum**

7. Which components do a semi-monocoque fuselage consists of?

**A stressed skin structure in which the skin is supported by a lightweight framework, such as longerons, stringers and formers**

8. What are the most frequent used materials in a monocoque or semi-monocoque structure?

**Aluminum or magnesium alloy**

9. Monocoque fuselages derive their strength from:

**The skin**

10. Monocoque fuselages derive their strength from:

**The skin**

11. In the context of airframe load path philosophies a 'fail safe' component is:

**A component incorporated in a large aircraft which is designed so that, following its failure, the remaining structure can withstand reasonable loads without failure until the damage is detected**

12. How can you tell when metallic bonding is incorrect?

**Corrosion at skin joints**

13. A framework of truss type fuselage is used in:

**Light training aircraft mainly**

14. Engine compartment decking and firewalls are manufactured from:

**Stainless steel or titanium sheet**

15. The purpose of stringers, used in fuselage construction, is to:

**Assist the skin to withstand longitudinal compressive loads**

16. With reference to stringers, they:

**Integrate the strains due to pressurisation to which the skin is subjected and convert them into a tensile stress**

17. The function of stringers in the construction of the fuselage is:

**To provide support for the skin and to absorb some of the pressurization strain as tensile loading**

18. MZFM is:

**The total maximum permissible mass of the aircraft without usable fuel**

19. For fail safe designed structural components:

1) there is more than one load carrying component

2) one load carrying component is sufficient, provided it is strong enough

3) the component is removed at the end of the calculated life time or number of cycles

4) the design is based on the principle of redundancy of components

The combination that regroups all of the correct statements is:

**1, 4**

20. The principle of the safe life design of an aircraft is based on the:

**Replacement of parts after a given number of cycles or hours of use**

21. The principle of damage tolerance in structural design of an aircraft is based on the:

**Capability to withstand a certain amount of weakening of the structure without catastrophic failure**

22. Which of these statements about structural design principles are correct or incorrect?

1) The damage tolerance principle takes cracking of the structure into account

2) The safe life principle is based on the replacement of parts after a given number of cycles or flight hours

**1) is correct, 2) is correct**

23. A safe life aircraft structural component:

**May be used during a declared number of cycles or flight hours**

24. According JAR/CS 25 the allowable quantitative average failure probability per flight hour for a catastrophic failure should be on the order of (^means to the power of):

**Less than  $10^{-9}$  (extremely improbable)**

25. According JAR/CS 25 the allowable quantitative average failure probability per flight hour for a major failure should be on the order of (^means to the power of):

**Between  $10^{-5}$  and  $10^{-7}$  (remote)**

26. According JAR/CS 25 the worst effect of a catastrophic failure on the flight crew could be

**Fatalities or incapacitation**

27. According JAR/CS 25 the worst effect of a hazardous failure on the flight crew could be

**Physical distress or excessive workload, impairs ability to perform tasks**

28. According JAR/CS 25 the worst effect of a catastrophic failure on the aeroplane could be:

**Hull loss**

29. According JAR/CS 25 the worst effect of a major failure on the aeroplane could be:

**Significant reduction in functional capabilities or safety margins**

30. The principle of on condition maintenance is based on the:

**Monitoring of critical parameters and the replacement of parts if a limit value is exceeded**

31. The principle of on condition maintenance is based on the:

**Monitoring of critical parameters and the replacement of parts if a limit value is exceeded**

32. Which of these statements about structural design principles are correct or incorrect?

1) In structural design, fail safe implies redundant load paths

2) A safe life structure is based on a declared number of cycles or time period

**1) is correct, 2) is correct**

33. Which of these statements about structural design principles are correct or incorrect?

1) In structural design, fail safe implies parallel structural parts

2) In structural design, safe life implies the structure will never fail during a declared time period or number of cycles

**1) is correct, 2) is incorrect**

34. Which of these statements about structural design principles are correct or incorrect?

1) In structural design, fail safe implies the structure will never fail

2) A safe life structure is based on a declared time period or number of cycles

**1) is incorrect, 2) is correct**

35. For safe life designed structural components:

1) ~~there is more than one load carrying component~~

2) **one load carrying component is sufficient for a given load, provided it is strong enough**

3) **the component is removed at the end of the calculated life time or number of cycles**

4) ~~the design is based on the principle of redundancy of components~~

The combination that regroups all of the correct statements is:

**2, 3**

36. Which of these statements about structural design principles are correct or incorrect?

1) ~~The damage tolerance principle assumes cracks in the structure will never occur~~

2) **The safe life principle is based on the replacement of parts after a given number of cycles or flight hours**

**1) is incorrect, 2) is correct**

37. Loads on the cylindrical part of the fuselage during pressurisation are carried by the:

**Skin**

38. A sandwich type structure is often used in aircraft because of it's:

**Low mass and high stiffness**

39. The fuselage structure of a pressurised transport aeroplane is an example of a:

**Semi-monocoque structure**

40. What are the three elements of the fuselage structure of a large transport aeroplane?

**Skin, frames, stringers**

41. A semi-monocoque aircraft fuselage structure usually consists of:

**Skin, frames stringers**

42. A sandwich structural part:

**Consists of two thin sheets separated by a light core material**

43. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) ~~The main function of the core material is sound insulation~~

2) ~~A sandwich structural part is well suited for absorbing concentrated loads~~

**1) is incorrect, 2) is incorrect**

44. A sandwich structural part is unsuitable for absorbing:

**Concentrated loads**

45. A composite structural component consists of:

**A matrix and fibres**

46. The pressurisation load on the skin of a fuselage is:

**Tension**

47. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) A sandwich structural part consists of fibres and a resin

2) A sandwich structural part is not suitable for absorbing concentrated loads

**1) is incorrect, 2) is correct**

48. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) A sandwich structural part consists of two thin sheets enclosing a light core material

2) A sandwich structural part is suitable for absorbing concentrated loads

**1) is correct, 2) is incorrect**

49. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) The main function of the core material is to stabilise the covering sheets

2) A sandwich structural part is unsuitable for absorbing concentrated loads

**1) is correct, 2) is correct**

50. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) The main function of the core material is to stabilise the covering sheets

2) A sandwich structural part is well suited for absorbing concentrated loads

**1) is correct, 2) is incorrect**

51. Which of these statements about composite and metal structures are correct or incorrect?

1) For a structural component with given dimensions composite materials enable a structural component's strength to be tailored to the direction of the load

2) Composite materials enable structures with higher strength/weight ratio than metal structures

**1) is correct, 2) is correct**

52. Which of these statements about composite and metal structures are correct or incorrect?

1) In a structural component with given dimensions constructed of composite materials, the strength is the same in all directions

2) Composite materials enable structures with lower strength/weight ratio than metal structures

**1) is incorrect, 2) is incorrect**

53. Which of these statements about composite and metal structures are correct or incorrect?

1) In a structural component with given dimensions constructed of composite materials, the strength is the same in all directions

2) Composite materials enable structures with higher strength/weight ratio than metal structures

**1) is incorrect, 2) is correct**

54. An electrically heated windscreen is manufactured from:

**A glass and polycarbonate laminate**

55. Cockpit indications associated with a windscreen heating system usually comprise:

**A green system "ON" information light and an amber system failure light**

56. The middle layer of a heated windscreen is made of:

**Soft polycarbonate**

57. Which of these statements regarding cockpit windows are correct or incorrect?

1) On some aeroplanes the cockpit windows have an additional speed restriction, related to bird impact, when window heating is inoperative

2) Cockpit side windows are always provided with a de-icing system

**1) is correct 2) is incorrect**

58. Which of these statements regarding cockpit windows are correct or incorrect?

1) On some aeroplanes the cockpit windows have an additional speed restriction, related to bird impact, when window heating is inoperative

2) Cockpit side windows are usually defogged only

**1) is correct 2) is correct**

59. Which of these statements regarding cockpit windows are correct or incorrect?

1) On some aeroplanes the cockpit windows never have an additional speed restriction, related to bird impact, when window heating is inoperative

2) Cockpit side windows are always provided with a de-icing system

**1) is incorrect 2) is incorrect**

60. In flight the cantilever wing of an aircraft containing fuel is subjected to vertical loads that produce a bending moment which is:

**Highest at the wing root**

61. The Maximum Zero Fuel Weight:

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:

**1,2,3**

62. 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:

**Compression, then in tension**

63. On a non-stressed skin type wing, the wing structure elements which take up the vertical bending moments  $M_x$  are:

**The spars**

64. When do you say that an aircraft has a cantilever wing?

**When the wing is attached to the fuselage at or near one end only**

65. What mission does the strut have, often observed between the fuselage and the wing, on small high wing aircraft?

**Supporting the wing while the aircraft is on ground and when airborne**

66. Wings without exterior support is called:

**Cantilever**

67. A wing structure consists primarily of:

**A front and rear main spar with ribs and stringers**

68. Which part of a wing, other than stressed skin construction, takes upward loads?

**Spars**

69. The torsion box of a modern aircraft wing structure consists of:

**Spars, skin, stringers and ribs**

70. How can wing bending moments be reduced in flight?

**By using aileron up float and using the fuel in the wings last**

71. The bending loads on a cantilever wing due to lift are carried by the:

1) upper skin surface

2) lower skin surface

3) wing root fairing

4) spar or spars

The combination that regroups all of the correct statements is:

**1, 2, 4**

72. Whilst stationary on the ground in a hangar the most important loads on a cantilever wing are:

**Tension in the upper surface, compression in the lower surface**

73. In straight and level flight the most important loads on a cantilever wing are:

**Compression in the upper surface, tension in the lower surface**

74. When the wing skin is not able to carry loads, the structural elements of the wing, which carry the bending moment, are:

**The spars**

75. Significant torsion effects in a wing during flight can be caused by:

**Aileron deflection**

76. Which of these statements about the wing structure is correct?

**A torsion box is formed by wing spars, ribs and wing skin reinforced by stringers**

77. What is the load in the upper respectively lower girder of a spar of a cantilever wing during straight and level flight?

**Compression in the upper girder and tension in the lower girder**

78. A cantilever wing is:

**A wing attached to the fuselage at the wing root only**

79. The function of ribs in a wing is to:

**Give the wing the desired aerodynamic shape**

80. A wing spar typically consists of:

**A web and girders**

81. One function of a rib is:

**To maintain the aerodynamic shape of the wing**

82. A non-cantilever wing is:

**A wing supported by braces or a strut connected to the fuselage**

83. The advantage of mounting the tailplane on top of the vertical stabilizer is:

**To withdraw it from the influence of wing turbulence**

84. The elevators of a conventional airplane are used to provide rotation about the

**Lateral axis**

85. What is the name of the control surface that rotates an aeroplane about its vertical axis?

**The rudder**

86. If the control stick of an aircraft is moved forward:

**The elevator will move down**

87. Which controls act together by a V-tail aircraft?

**The stick in one axis and the rudder pedals**

88. What is the reason for putting the horizontal stabilizer on top of the fin?

**To be out of the way of the wing down wash**

89. The empennage consists of the:

**Horizontal and vertical stabilizer**

90. The two deformation modes that cause wing flutter are:

**Torsion and bending**

91. To prevent flutter on control surfaces it helps to

**Balance the surface**

92. Control surface flutter can be avoided by:

1) a high torsional stiffness of the structure

2) a low torsional stiffness of the structure

3) locating a balancing mass in front of the control hinge

4) locating a balancing mass behind the control hinge

The combination that regroups all of the correct statements is:

**1, 3**

93. One design method to avoid control surface flutter is:  
**Ensuring correct mass distribution within the control surface**
94. To achieve control flutter damping the balance mass must be located:  
**In front of the control surface hinge**
95. When a wing bends downwards, aileron flutter might occur if the aileron deflects:  
**Upwards, because the location of the aileron centre of gravity lies behind the hinge line**
96. A torsion link assembly is installed on the landing gear to:  
**Avoid rotation of the piston rod relative to the gear oleo strut**
97. In a commercial transport aircraft the landing gear operating system is usually:  
**Hydraulically driven**
98. In a modern jet transport aircraft, how can the landing gear be extended if there is a complete hydraulic system failure.  
**Mechanically**
99. If the profile grooves or the tread of a new aircraft tyre are worn, the tyre can be:  
**Repaired several times**
100. The operating principle of an anti skid system is as follows: the brake pressure will be:  
**Decreased on the slower turning wheels**
101. The type of brake unit found on most transport aeroplanes is a:  
**Multiple disk brakes**
102. The reason for fitting thermal plugs to aircraft wheels is that they:  
**Release air from the tyre in case of overheating**
103. Thermal plugs are installed in:  
**Wheel rims**
104. Landing gear torque links are used to:  
**Prevent rotation of the landing gear piston in the oleo strut**
105. A main landing gear is said to be "locked down" when:  
**The strut is locked by an over centre mechanism**

106. Shimmy occurs on the nosewheel 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. an accumulator associated with the steering cylinder

The combination of correct statements is:

**1, 4**

107. The illumination of the green lamp indicator corresponding to a landing gear means that the landing gear is:

**Locked-down**

108. 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:

**2, 4**

109. In a hydraulic braking system, the accumulator is:

**An accumulator designed to restore brake energy in the event of a hydraulic failure**

110. When a landing gear wheel is hydroplaning, its friction factor is equal to:

**0**

111. A tubeless tyre is a tyre:

1. which requires solid or branched wheels
2. whose valve can be sheared in sudden accelerations
3. whose mounting rim must be flawless
4. which requires no rim protection between rim flange and tire removing device
5. which does not burst in the event of a tyre puncture
6. which eliminates internal friction between the tube and the tyre

The combination regrouping all the correct statements is :

**1, 5, 6**

112. 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 rate
5. tire pressure

The combination regrouping all the correct statements is:

**1, 2, 4**

113. The function of a fusible plug is to

**Protect the tyre against explosion due to excessive temperature**

114. Which is (are) the damping element(s) in a landing gear shock absorber used on larger aircraft?

**Nitrogen and a viscous liquid**

115. In some aircraft, there is a protection device to avoid the landing gear being inadvertently retracted on the ground. It consists of:

**A latch located in the landing gear lever**

116. On large aeroplanes equipped with power brakes, the main source of power is derived from:

**The aeroplane's hydraulic system**

117. "Nose wheel shimmy" may be described as:

**A possibly damaging vibration of the nose wheel when moving on the ground**

118. Tyre "creep" may be described as the:

**Circumferential movement of the tyre in relation to the wheel flange**

119. The ABS (Auto Brake System) is being disconnected after landing..

**By pilot action**

120. The purposes of the oil and the nitrogen in an oleo-pneumatic strut are:

**The oil supplies the damping function and the nitrogen supplies the spring function**

121. The part of the flight that will cause the highest loads on the torsion link in a bogie gear is

**Taxiing with a small turning radius**

122. Compared to a tyre fitted with an inner tube, a tubeless tyre presents the following characteristics:

~~1 - high heating~~

~~2 - valve fragility~~

3 - lower risk of bursting

4 - better adjustment to wheels

The combination containing all the correct statements is:

**3 - 4**

123. 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 hollow bolt screwed into the wheel which melts at a given temperature (thermal fuse) and deflates the tyre**

124. On an aircraft landing gear, an under-inflated tyre:

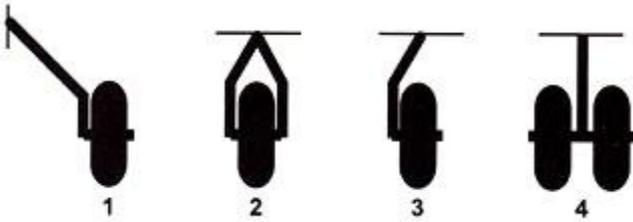
**Will wear at the shoulders**

125. A scissor is a component found on landing gears. Its function is to :

**Prevent any rotation of the oleo strut in the undercarriage shock absorber**

126. Associate the correct legend to each of the numbered diagrams:

**1- cantilever 2- fork 3- half fork 4- dual wheels**



127. The disk brakes have more or less replaced the drum brakes. Why?

**Owing to a loss of braking action due to heat generation problem**

128. An oleo-type landing gear shock absorber is often equipped with a torque link, why?

a) To prevent the nose wheel from shimmying

b) To allow the piston to move freely in and out the landing gear cylinder

c) To prevent the landing gear cylinder from rotating

**Both b and c are correct**

129. If the normal method of lowering the hydraulic operated retractable landing gear fails, there has to be an alternate method, this usually works as?

**A system integrated with the original that allows the gear, by mean of its own weight and aerodynamic resistance, to mechanically lock in place**

130. A hydraulically operated nose gear steering cylinder has at least two functions. The first is to allow the pilot to steer the aeroplane, and the second function is?

**Shimmy dampener**

131. On the brake assembly there is an anti-skid system. From which device does the anti-skid control box get the information to regulate the brake pressure?

**From a wheel speed sensor**

132. On large modern transport aircraft, the brake assembly consists of?

**Multiple disk brake type**

133. What are purpose and placing of a "fusible plug" on the tires?

**It is placed in the wheel and reacts on temperature. At excessive temperatures it melts which allows the air to escape from the tire, leaving the tire unpressurized**

134. With the antiskid system unserviceable, how should brake application be made?

**With an on and off braking action**

135. The main purpose of using anti-skid units in the wheel-brake system is to:

**Reduce tyre wear**

136. To prevent the landing gear from collapsing when the aircraft is parked on the ground by, following device is used:

**Locking pins with flags**

137. Gear retraction systems are classified according to the power source used for retraction and extension. Which are the most frequently used on larger aircraft?

**Hydraulic**

138. Control on the ground for small aeroplanes is provided by steering the nose wheel through connections to the rudder pedals, but large aeroplanes have normally:

**Hydraulic power steering.**

139. If an aircraft is equipped with a fixed gear, which of the mentioned factors will differ from a retractable landing gear?

**Parasite drag**

140. The "ply rating" of a tire is?

**A parameter indicating the tire relative strength**

141. Generally, on modern jet transport aeroplanes, if there is a complete hydraulic system failure, the landing gear can be extended:

**By gravity extension**

142. Overcentre mechanisms in landing gear systems are used to:

**Lock the landing gear in the up and/or down position**

143. The function of a scissor (torsion link) in a landing gear is to:

**Prevent any rotation of the oleo strut in the landing gear shock absorber**

144. The pilot may be prevented from retracting the landing gear whilst the aircraft is on the ground by:

**The electrical control system being routed through the weight on wheels switch**

145. Emergency extension of landing gear systems can be performed:

~~1) with compressed CO<sub>2</sub>~~

**2) with compressed nitrogen**

~~3) with compressed oxygen~~

**4) by mechanical/manual means**

5) by free fall

The combination regrouping all the correct statements is:

**2, 4, 5**

146. An undercarriage leg is locked when:

**It is mechanically locked by an over-centre mechanism**

147. What are the two main types of landing gear used on modern aircraft?

**Telescopic and sprung leg**

148. In a landing gear, movement is damped by:

**Nitrogen and liquid**

149. What is reducing the shocks on the landing gear in an oleo shock absorber?

**Cushion of compressed air**

150. Shimmy is:

**Sinusoidal and possibly damaging movement of the nose wheel on the ground**

151. The cause of rather violent vibration of the nose wheel, described as shimmy, is often:

a) tyre imbalance.

~~b) an uneven surface.~~

c) looseness of the nose wheel support mechanism.

**Both, A and C are correct**

152. The function of an accumulator in a hydraulic brake system is:

**To supply a limited amount of brake energy in the event of failure of the hydraulic system normally supplying the brakes**

153. In a hydraulic braking system, the accumulator is:

**An accumulator designed to restore braking energy in the event of a hydraulic failure**

154. Auto-brakes are disengaged:

**By the pilot**

155. In a HP brake hydraulic system:

**A separate handbrake system is always fitted together with its own accumulator and its own system components**

NRV = non return valve

PRV = pressure reducing valve

156. In a hydraulic braking system, an accumulator is precharged to 1600 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:

**3000 psi**

157. What brakes are used on modern transport aircraft?

**Multi disc brakes**

158. An anti-skid system will:

**Reduce brake pressure to slower turning wheels**

159. The pressure for the braking system of a modern aircraft originates from:

**The main hydraulic system**

160. With the anti-skid system unserviceable, how should brake application be made?

**With an on and off braking action**

161. To avoid the risk of tyre burst from overheating there is:

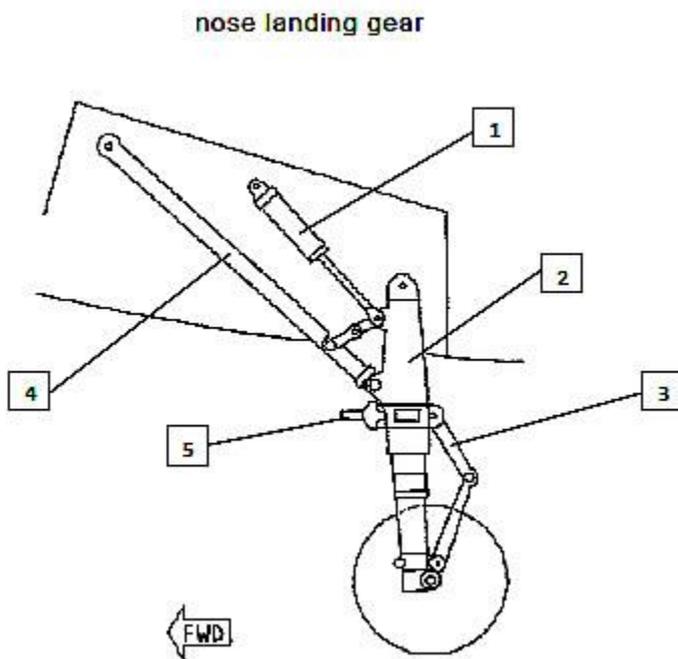
**A thermal plug that deflates the tyre at a specific temperature**

162. An under-inflated tyre on a dry runway:

**Increases wear on the shoulder**

163. Which describes best the component (3) in a nose landing gear assembly?

**Torque link**



164. Which describes best the component (5) in a nose landing gear assembly?

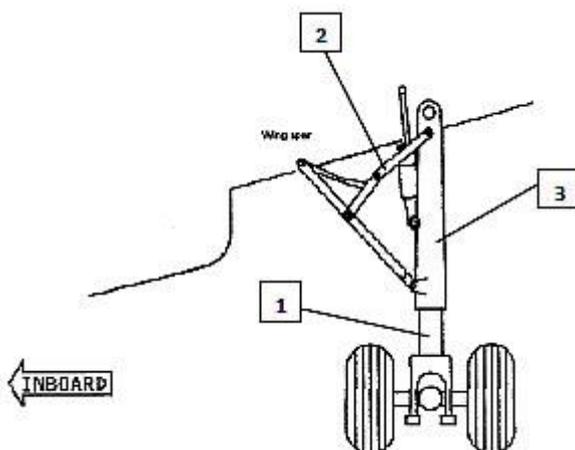
**Steering cylinder**

165. Which describes best the component (1) in a nose landing gear assembly?

**Actuating cylinder**

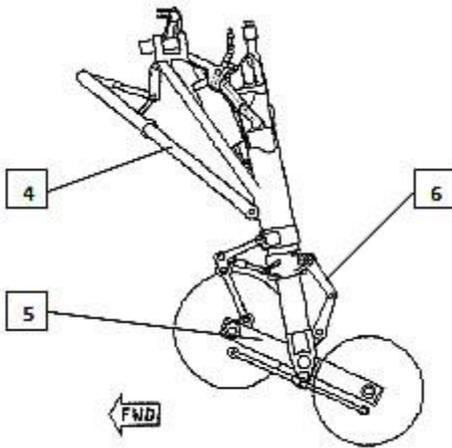
166. Which describes best the component (2) in a main landing gear assembly?

**Overcenter link**



167. Which describes best the component (5) in a main landing gear assembly?

**Truck beam**



168. Which describes best the component (4) in a main landing gear assembly?

**Drag strut**

169. Which describes best the component (6) in a main landing gear assembly?

**Torque link**

170. The automatic ground spoiler extension system is normally activated during landing by:

**Main wheel spin up**

171. Generally, on modern jet transport aeroplanes, if there is a complete hydraulic system failure, the landing gear can be extended by:

**Gravity extension**

172. On most large aeroplanes, the main source of braking power is derived from:

**The hydraulic system**

173. The auto-brake system is disconnected during landing:

**By the pilot**

174. The trim tab:

**Reduces hinge moment and control surface efficiency**

175. The purpose of a trim tab (device) is to:

**Reduce or to cancel control forces**

176. 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:

**3 and 5**

177. An artificial feel unit is necessary in the pitch channel when:

**The elevators are actuated by irreversible servo-control units**

178. An artificial feel unit system:

**Must be mounted in parallel on an irreversible servo-control unit**

179. Which of these signals are inputs, at least, in the stall warning computers?

**Angle of attack and flaps and slats deflection**

180. In a steep turn to the left, when using spoilers...

**The right aileron will descend, the left one will ascend, the right spoiler will retract and the left one will extend**

181. On an aircraft, the Krueger flap is a:

**Leading edge flap close to the wing root**

182. The reason for the trim switch on a control column to consist of two separate switches is

**To reduce the probability of a trim-runaway**

183. On an aeroplane, spoilers are:

**Upper wing surface devices, their deflection is symmetrical or asymmetrical**

184. On an airplane, the Krueger flaps are:

**Leading edge flaps close to the wing root**

185. One type of flap used on aircraft moves down and increases the wing area by moving aft when lowered. This flap is known as:

**Fowler flap**

186. The control surface that rotates the aircraft about its longitudinal axis is/are the

**Ailerons**

187. The function of the rudder limiter on some aircraft is to?

**Prevent excessive loads from acting on the rudder**

188. A servo tab moves?

**Opposite of the control surface to which it is hinged**

189. Stall fences mounted on an aircraft wing are used:

**To prevent the tendency of the outer portion of the wing to stall first**

190. The elevators of a conventional airliner are used to provide rotation about the:

**Lateral axis**

191. What is the name of the control surface that rotates an aeroplane about its longitudinal or roll axis?

**The ailerons**

192. Longitudinal stability involves the motion of the aircraft about its:

**Lateral axis**

193. What are Krueger flaps?

**Leading edge flaps**

194. If the control stick of an aircraft is moved forward and to the right, the left aileron will move:

**Down, and the elevator will move down**

195. Flaps which not only move down, but also increase the wing area by extending backwards on tracking are called:

**Fowler flap**

196. A Krueger flap is:

**A leading edge flap type which is formed by extending an area of the wing downwards and forward at the leading edge**

197. With which system is differential control associated?

**Aileron system**

198. If the control stick of an aircraft with properly rigged flight controls is moved rearward and to the left, the right aileron will move

**Down and the elevator will move up**

199. The rudder limiters on several aircraft have a specific function, which is to:

**Prevent excessive loads from acting on the rudder**

200. Some aircraft use a fly by wire system to move the primary flight controls, this system is based on;

**Electrical signals from a computer sent to hydraulic actuators**

201. For a JAR 25 aeroplane, spoilers are:

**Upper wing surface devices, their deflection is symmetrical or asymmetrical**

202. If an artificial feel unit is fitted, it would be connected:

**In parallel with the primary controls**

203. How do differential ailerons work?

**Equalize the drag on up-going and down-going wings**

204. The range of control surface movements is limited by:

**Providing control stops**

205. Over-tensioned cables in a flight control system could result in:

**Excessive friction in the system**

206. A force gradient unit is used to:

**Add artificial feel into a hydraulically power flight control system**

207. What is the purpose of inboard ailerons?

**To reduce wing twist at high speed**

208. What are flaperons?

**Combined ailerons and flaps**

209. Where are spoilers fitted?

**Symmetrically on the wing upper surface**

210. Why is artificial feel required and how is the degree of feel set?

**Fitted to prevent overstressing of the aircraft and gives increased forces as the speed increases**

211. In a flight control system a device in which a small input operates a large output in a strictly proportionate manner is called:

**A servomechanism**

212. Which is the correct statement regarding a large aircraft fitted with both inboard and outboard ailerons?

**The outboard ailerons are typically used only when the flaps are extended**

213. With speed brakes deployed in flight and a pilot's input to turn left:

**Spoilers move up on the down-going wing and down on the up-going wing**

214. A cable operated control system has external locks:

**When fitted to the control surface, they will prevent movement of the control column if the controls are not fitted with servo tabs**

215. A control surface has its limitations in movement by:

**Primary stops at the surface**

216. A primary stop is mounted on an elevator control system in order to:

**Restrict the range of movement of the elevator**

217. Trailing edge flaps:

**Increase lift at a lower AOA**

218. The reason for a double switch on the elevator trim is:

**To reduce the probability of a trim runaway**

219. Why are flaps and slats fitted to modern aircraft?

**To reduce takeoff, approach and landing speeds to an acceptable level**

220. A "slat" on a wing is?

**A leading edge device that causes some of the high energy air to flow over the upper surface of the wing**

221. Flaps which not only move down, but also increase the wing area by extending backwards on tracking are called:

**Fowler flap**

222. Some aircraft use a fly-by-wire system to move the primary flight controls. This system is based on:

**Electrical signals from a computer sent to hydraulic actuators**

223. An artificial feel system:

**Functions in parallel with an irreversible hydraulic actuator**

224. The expression "primary flight control" applies to the:

1) elevator

2) speed brake

3) lift augmentation devices

4) roll spoiler

The combination that regroups all of the correct statements is:

**1, 4**

225. A flight control surface actuator is said to be "reversible" when:

**There is feedback to the pilot's controls of the aerodynamic forces acting on the control surface**

226. Primary flight controls are:

**Ailerons, elevators and rudder**

227. Most transport aeroplanes are provided with protection against control jamming. This means that:

**The flight control system has provisions to disconnect the part of the control system that becomes blocked**

228. Most large conventional aeroplanes are not provided with aileron and rudder trim tabs. Is it still possible to trim these control surfaces?

**Yes, trimming is possible by adjusting the neutral point of the artificial feel mechanism by means of a trim switch**

229. The reason for a double switch on the elevator trim is:

**To reduce the probability of a trim runaway**

230. Rudder trim adjustment in an aeroplane with irreversible flight controls is:

**An adjustment of the zero force rudder position**

231. Which of these statements regarding most gust lock systems is correct?

**When the gust lock is ON there is protection to prevent take-off**

232. An aeroplane equipped with irreversible flight controls:

**Need not to be equipped with a separate gust lock system**

233. On a large transport aeroplane, the auto-slat system:

**Extends (part of) the slats automatically when a certain value of angle of attack is exceeded**

234. An aeroplane equipped with fully powered flight controls (irreversible type):

**Requires the use of an artificial feel system**

235. The expression "primary flight controls" applies to the:

1) stabiliser

2) rudder

3) speed brake

4) aileron

The combination that regroups all of the correct statements is:

**2, 4**

236. The expression "secondary flight control" applies to the:

1) elevator

2) speed brake

3) lift-augmentation devices

4) roll spoiler

The combination that regroups all of the correct statements is:

**2, 3**

237. The expression "secondary flight control" applies to the:

1) stabiliser

2) rudder

3) speed brake

4) aileron

The combination that regroups all of the correct statements is:

**1, 3**

238. Which of these statements about a gust lock system are correct or incorrect?

1) There is no need for a gust lock on irreversible flight controls

2) Manual flight controls should have a gust lock

**1) is correct 2) is correct**

239. Which of these statements about a gust lock system are correct or incorrect?

1) Irreversible flight controls should have a gust lock

2) There is no need for a gust lock on manual flight controls

**1) is incorrect 2) is incorrect**

240. Which of these statements about a gust lock system are correct or incorrect?

1) There is no need for a gust lock on irreversible flight controls

2) There is no need for a gust lock on manual flight controls

**1) is correct 2) is incorrect**

241. Which of these statements about a gust lock system are correct or incorrect?

1) There should be suitable design precautions to prevent flight with the gust lock engaged

2) Reversible flight controls should have a gust lock

**1) is correct 2) is correct**

242. Which of these statements about a gust lock system are correct or incorrect?

1) A gust lock can be used in flight to reduce the effects of turbulence

2) There is no need for a gust lock on reversible flight controls

**1) is incorrect 2) is incorrect**

243. Which of these statements about a gust lock system are correct or incorrect?

1) There should be suitable design precautions to prevent flight with the gust lock engaged

2) There is no need for a gust lock on reversible flight controls

**1) is correct 2) is incorrect**

244. Which of these statements about a gust lock system are correct or incorrect?

1) A gust lock can be used in flight to reduce the effects of turbulence

2) Reversible flight controls should have a gust lock

**1) is incorrect 2) is correct**

245. An aeroplane equipped with reversible flight controls:

**Does not require an artificial feel system**

246. Trimming of aileron and rudder in an irreversible flight control system:

**Is achieved by adjusting the "zero force point" of the feel system**

247. Which of these statements about trimming in a irreversible flight control system of a conventional aeroplane are correct or incorrect?

1) The zero force position of the control column does not change when using the elevator trim

2) The zero force position of the control wheel changes when using the aileron trim

**1) is correct 2) is correct**

248. Which of these statements about trimming in a irreversible flight control system of a conventional aeroplane are correct or incorrect?

1) The zero force position of the control column does not change when using the elevator trim

2) The zero force position of the control wheel does not change when using the aileron trim

**1) is correct 2) is incorrect**

249. Given a conventional transport aeroplane with irreversible flight controls on the ground with engines running. Which of these statements about rudder trim actuation is correct?

**The rudder moves, the rudder pedals move in the corresponding direction**

250. Which of these statements about rudder limiting are correct or incorrect?

1) A rudder ratio changer system reduces the rudder deflection for a given rudder pedal deflection as the IAS increases

2) A variable stop system limits both rudder and rudder pedal deflection as the IAS increases

**1) is correct 2) is correct**

251. Which of these statements about rudder limiting are correct or incorrect?

1) A rudder ratio changer system limits both rudder and rudder pedal deflection as the IAS increases

2) A variable stop system reduces the rudder deflection for a given rudder pedal deflection as the IAS increases

**1) is incorrect 2) is incorrect**

252. Which of these statements about rudder limiting are correct or incorrect?

1) A rudder ratio changer system reduces the rudder deflection for a given rudder pedal deflection as the IAS increases

2) A variable stop system limits both rudder and rudder pedal deflection as the IAS increases

**1) is correct 2) is correct**

253. Hydraulic fluids must have the following characteristics:

1. thermal stability

2. low emulsifying characteristics

3. corrosion resistance

4. good resistance to combustion

5. high compressibility

6. high volatility

7. high viscosity

The combination regrouping all the correct statements is:

**1, 2, 3, 4**

254. 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:

**3000 psi**

255. Where in a hydraulic system might overheat indicators be installed?

**At the pumps**

256. Hydraulic fluids:

**Are irritating to eyes and skin**

257. Hydraulic fluids used in systems of modern airliners are:

**Phosphate ester base fluids**

258. Hydraulic power is a function of:

**System pressure and volume flow**

259. What is the normal pressure in a main hydraulic system of a modern turbojet aircraft?

**3000 psi**

260. In hydraulic systems of modern transport category aircraft the fluids used are:

**Synthetic oil**

261. The type of hydraulic oil used in modern hydraulic systems is:

**Synthetic oil**

262. In a modern hydraulic system, "hydraulic fuses" can be found. Their function is:

**To prevent total system loss in case of a leaking hydraulic line**

263. In a hydraulic system, the reservoir is pressurized in order to:

**Prevent pump cavitations**

264. The purpose of a shuttle valve is to:

**Supply an operating unit with the most appropriate system pressure**

265. Shuttle valves will automatically:

**Switch hydraulically operated units to the most appropriate pressure supply**

266. In addition to energy storage the accumulator of the hydraulic system is used:

**For dampening pressure surges in the system**

267. Hydraulic fluids of synthetic origin are:

**Purple**

268. The function of the selector valve is to:

**Communicate system pressure to either side of an actuator**

269. The component that transforms the hydraulic pressure into a linear motion is called...

**An actuator or jack**

270. The aircraft hydraulic system is designed to produce:

**High pressure and large flow**

271. The hydraulic device, which functionality is comparable to an electronic diode, is a:

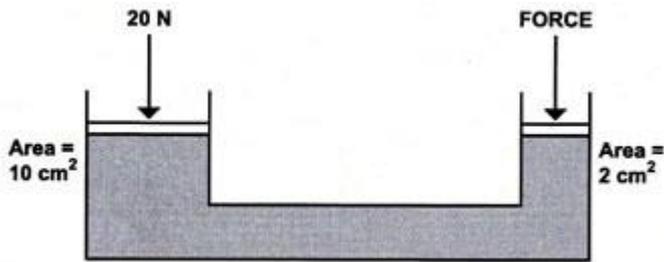
**Check valve**

272. The type of hydraulic fluid which has the highest resistance against cavitations is:

**Synthetic fluid**

273. In the hydraulic press schematically shown, what balancing Force would be acting on the right hand side?  
(The diagram is not to scale)

**4 N**



274. 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:

**1500 psi**

275. Internal leakage in a hydraulic system will cause:

**An increased fluid temperature**

276. Discounting the possibility of leak, the level in a hydraulic reservoir will:

**Fluctuate with jack displacement and accumulator pressure**

277. An accumulator in a hydraulic system will:

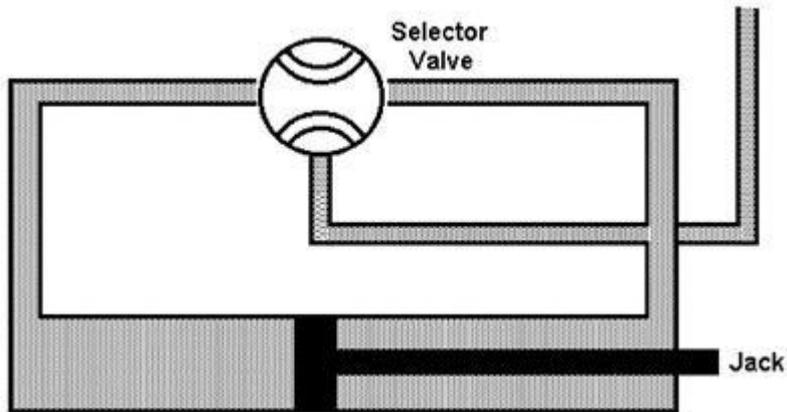
**Store fluid under pressure**

278. Assuming a hydraulic accumulator is pre-charged with nitrogen to 1000 psi. If the hydraulic system is then pressurised to its operating pressure of 3000 psi, the indicated pressure on the nitrogen side of the accumulator should be:

**3000 psi**

279. The schematic diagram illustrates a jack and selector valve in a typical hydraulic system. Assuming hydraulic pressure throughout:

**A condition of hydraulic lock exists and no movement of the jack will take place**



280. In hydraulic system, a shuttle valve:

**Allows two possible sources of pressure to operate one unit**

281. To allow for failure of the normal method of system pressure limiting control, a hydraulic system often incorporates

**A high pressure relief valve**

282. The Ram Air Turbine (RAT) provides emergency hydraulic power for:

**Flight controls in the event of loss of engine driven hydraulic power**

283. The hydraulic oil, entering the hydraulic pump, is slightly pressurised to:

**Prevent cavitations in the pump**

284. A hydraulic low pressure alert is the first indication of:

**The pump output pressure is insufficient**

285. For an aeroplane hydraulic supply circuit, the correct statement is:

**The security components comprise the filters, the pressure relief valves, the by-passes, and the fire shut-off valve**

286. The reservoir of a hydraulic system can be pressurised:

**By bleed air from the engine**

287. Relationships between the force, pressure and area

**Force = pressure x area**

288. A "hydraulic fuse" will:

**Detect a sufficient pressure drop across itself, or a specified volume of fluid passing through itself, and then shut off the flow of fluid to prevent the system of emptying itself**

289. The main reasons for using pressurised hydraulic reservoirs on jet transport aircraft is/are:

**To assure that an adequate supply of fluid free from foaming always is present at the pump inlet**

290. The oil reservoir in a hydraulic system has the purpose to serve as:

**All of the given alternatives are correct**

291. The reason for the pressure accumulator in the hydraulic system is:

**The accumulator serves as an internal shock absorber for the hydraulic system**

292. A variable displacement type hydraulic pump:

**Moves fluid quantity dependent on the system demand**

293. A complex hydraulic systems may pressurise the oil reservoir by means of bleed air from the engines, this is

**To secure reliable oil supply to the hydraulic pumps**

294. The following is normally true regarding hydraulic hand pumps. They are:

**Connected to the bottom of the reservoir**

295. State the advantages of the variable displacement hydraulic pump compared to the constant displacement pump.

**The variable displacement pump adjusts the fluid pumped to the fluid required, and the pump thereby adjusts the pressure output itself, and it moves fluid only when necessary**

296. What is the purpose of a "relief valve" in the hydraulic system?

**Make sure that the pressure does not exceed the max. permitted pressure in the system**

297. In a hydraulic system the master cylinders inner diameter is 10 mm<sup>2</sup>, and the actuator cylinders inner diameter is 100 mm<sup>2</sup>. If you press the master-cylinder 2 cm by using a 100 N force, the actuator cylinder will move:

**2 mm and produce a force of 1000 N**

298. The indication of an internal leak in a hydraulic system will be:

**A rise in fluid temperature**

299. The purpose of pressurising some hydraulic reservoirs is to:

**Provide a positive feed to the main pump**

300. Pascal's law states that:

**Pressure in an enclosed container is transmitted equally and undiminished to all parts of the container and acts at right angles to the enclosing walls**

301. A modern aeroplane is equipped with warning lights in the cockpit to monitor the hydraulic system. What does the illumination of the hydraulic oil temperature light indicate?

**Overheated hydraulic fluid in one of the pump return lines**

302. A thermal relief valve is installed in order to?

**Sense the ambient fluid temperature and when this temperature exceeds a pre-determined value, the valve depressurises the hydraulic system**

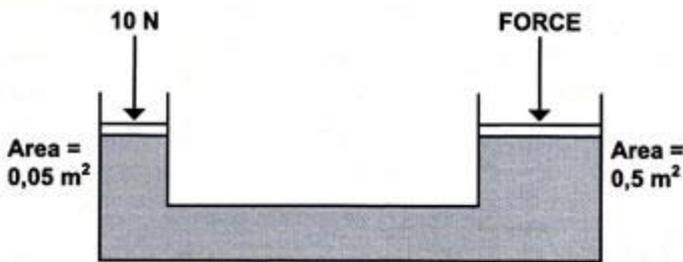
303. If piston A has an area of  $2 \text{ cm}^2$  and piston B has an area of  $10 \text{ cm}^2$ , when piston B moves down by  $5 \text{ cm}$ , how far will piston A have moved?

**25 cm**



304. In the diagram (not to scale), the balancing force required on the right hand side is:

**100 N**



305. The viscosity of a hydraulic fluid should be:

**The lowest to minimize power consumption and resistance to flow**

306. Viscosity is:

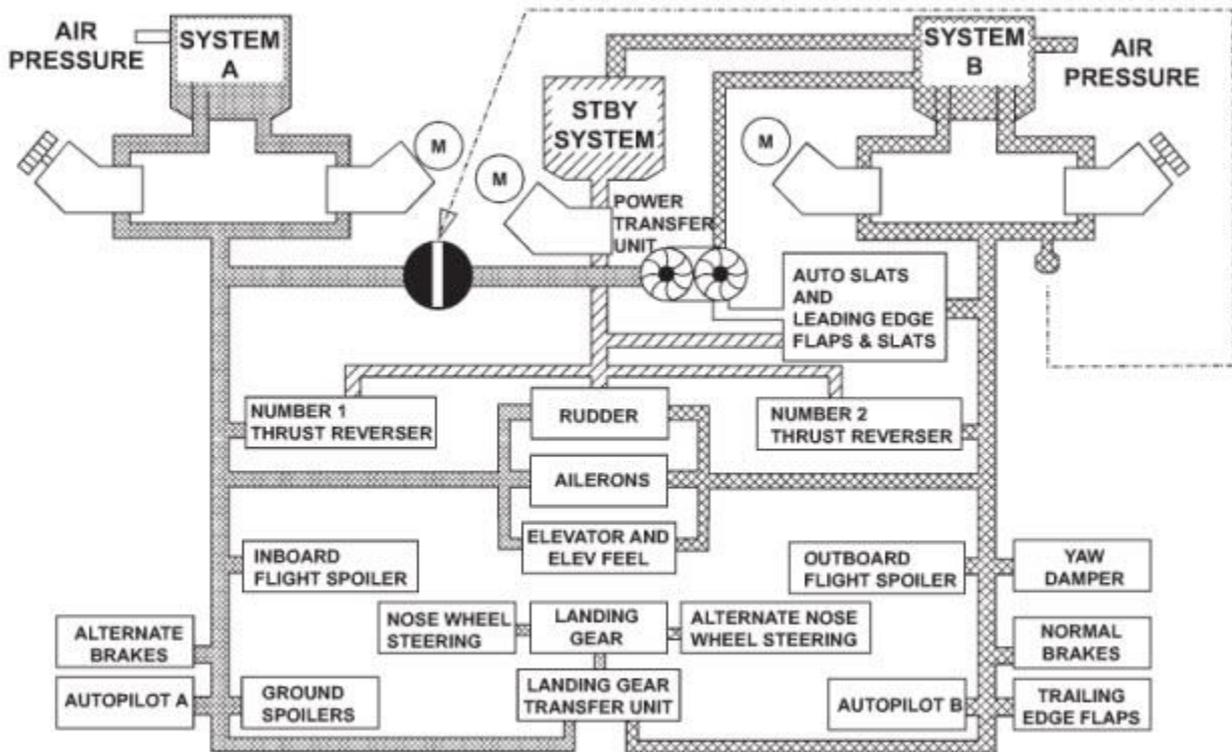
**The tendency of a liquid or gas to resist flow**

307. Where in a hydraulic system might overheat sensors be installed?

**At the pumps**

308. The total number of hydraulic pumps in this hydraulic system (excluding the PTU pump) is:

**5**



309. Synthetic hydraulic fluids:

**Are irritating to eyes and skin**

310. The transport aircraft hydraulic system is designed to produce:

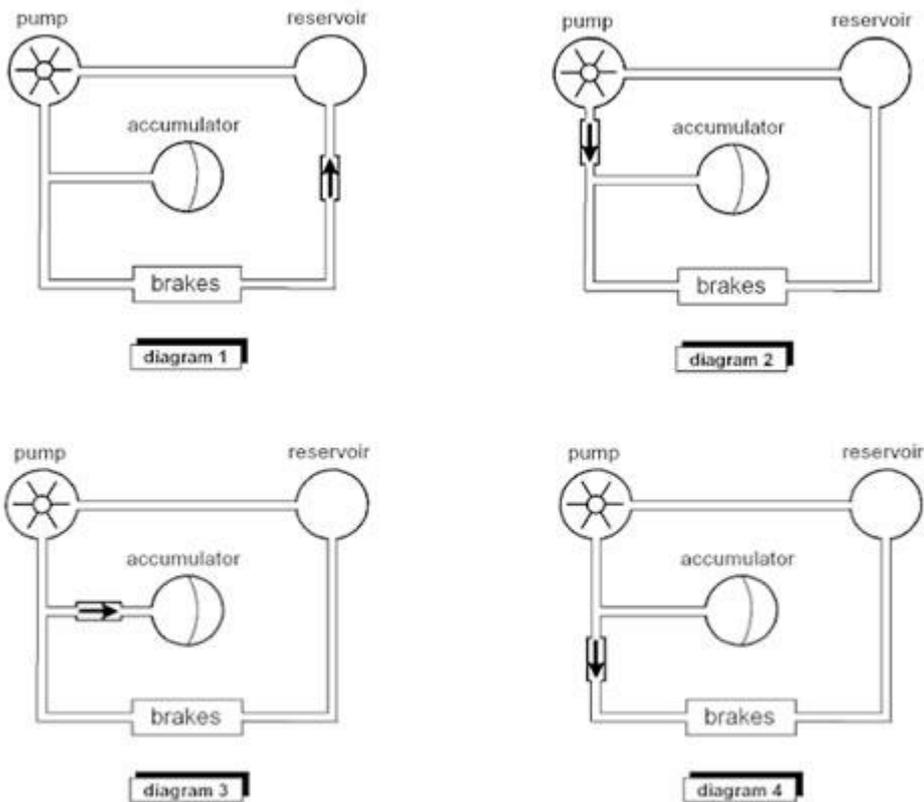
**High pressure and large flow**

311. An automatic cut-out valve is used in a:

**Fixed volume pressure control system**

312. The hydraulic system that works correctly is shown in figure:

**Diagram 2**



 check (non-return) valve

313. Pressure regulator is used in a hydraulic system:

**In conjunction with a constant delivery type pump**

314. A single acting actuator:

**Is powered in one direction only by hydraulic power, the return movement being under spring force**

315. Axial piston pumps are often used in hydraulic systems due to:

**Their ability to produce high pressure when required but can be off loaded to reduce power consumption**

316. Filters in hydraulic systems often incorporate pop out indicators to:

**Warn of an impending by-pass situation**

317. Filtration in a hydraulic system is usually ensured by:

**Filters in both the pressure and return lines**

318. In a hydraulic system, overheat detectors are mostly installed:

**At the pumps**

319. One of the functions of an accumulator in a hydraulic system is:

**To damp pressure surges in the system**

320. Should a hydraulic pump seize during operation:

**The quill drive will shear to offload and protect the gearbox**

321. The purpose of an accumulator in a hydraulic system is:

**To damp the fluid pressure variations**

322. When powering up a hydraulic system, the level in the reservoir will:

**Decrease slightly**

323. The purpose of a hydraulic fuse is to:

**Prevent leakage if the hydraulic line breaks**

324. A shuttle valve will:

**Automatically switch to a more appropriate source of hydraulic supply**

325. In the event of the normal hydraulic pressure regulation system failure, the following component is fitted in a typical hydraulic system:

**A pressure relief valve**

326. Hydraulic pressure typically used in the system of large transport aircraft is:

**3000 - 4000 psi**

327. The temperature of hydraulic fluid is measured:

**In the reservoir**

328. A linear actuator has a damaged seal, resulting in an internal leak. In addition to a loss of actuator efficiency, this will result in:

**An increase in fluid temperature**

329. If a hydraulic pump switch light "LOW" caption illuminates, the cause is assumed to be:

**Pump output pressure low**

330. Given an aeroplane with irreversible primary flight controls, how is control maintained if one hydraulic system is lost due to a hydraulic leak?

**The remaining systems will take over control**

331. Hydraulic fluids used in systems of large modern airliners are:

**Phosphate ester based fluids**

332. Hydraulic power is a function of:

**System pressure and volume flow**

333. The type of hydraulic oil used in most large aeroplanes is:

**Synthetic oil**

334. Purposes of an accumulator in a hydraulic system are:

- 1) to damp pressure fluctuations
- 2) to cool the hydraulic fluid
- 3) to serve as a limited alternate source of pressure
- 4) to serve as a main pressure source for normal operation

The combination that regroups all of the correct statements is:

**1, 3**

335. Parameters to monitor a hydraulic system in the cockpit can be:

**Pressure, fluid temperature and quantity**

336. A hydraulic shuttle valve:

**Enables an alternate supply to operate an actuator**

337. To protect against excessive system pressure, a hydraulic system usually incorporates:

**A high pressure relief valve**

338. Which of these statements about an aeroplane's hydraulic system is correct?

**The filters, the pressure relief valve(s), the by-pass valve(s), and the fire shut-off valve are safety features installed in the system**

339. The viscosity of a hydraulic fluid should be:

**Low to minimise power consumption and resistance to flow**

340. The pneumatic ice protection system is mainly used for:

**Wings**

341. With regard to the pneumatic mechanical devices which afford protection against the formation of ice, the only correct statement is:

**The pneumatic mechanical device can only be used as a de-icing device**

342. A pneumatic de-ice system should be operated..

**When there is approximately 1,5 cm of ice on leading edges**

343. Regarding carburetor ice, state the environmental caution areas for the formation of this type of ice.

**Temperature between - 5° C and + 18° C, visible moisture or relative humidity greater than 60 %**

344. The tubes in the de-ice boots are usually inflated alternately. Why?

**Because alternate inflation of de-ice boot tubes keeps disturbance of the airflow to minimum**

345. How much ice should be allowed to accumulate on the leading edge of the wing before the "de-ice boot" system is activated?

**1/4" - 1/2"**

346. The boots of a pneumatic de-icing system are normally made of:

**Neoprene rubber**

347. In the air cycle system the air is cooled down by expansion:

**In the turbine**

348. If the cabin altitude rises (aircraft in level flight), the differential pressure:

**Decreases**

349. 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 indicator,

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, 2, 3**

350. During a normal pressurised climb after take-off:

**Cabin pressure decreases more slowly than atmospheric pressure**

351. Refer to the figure below:

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:

**FL 230**

**INTERNATIONAL STANDARD ATMOSPHERE**

ALTITUDE Feet	TEMPERATURE		PRESSURE				PRESSURE RATIO $\delta=P/P_0$	RELATIVE DENSITY $\delta=\rho/\rho_0$	$\sqrt{\text{DENSITY}}$	SPEED of SOUND kts	ALTITUDE Metres
	°C	°F	mb	PSI	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	0,167	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	21,84	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

Differential pressure 5 psi = 345 hPa (i.e. the cabin still has an overpressure of 345 hPa above ambient)

Cabin Altitude 8'000 ft = 753 hPa (ISA Standard Atmosphere, standard levels: FL50 = 850 hPa, FL100 = 700 hPa, ref. subject 50 meteo); Ambient Pressure = 753 - 345 = 408 hPa

Pressure Altitude 408 hPa = 23'114 ft = ca FL230 (standard level 400 hPa = FL240)

Even if FL 240 is considered, FL 230 is still the most correct answer

352. Main cabin temperature is:

**Controlled automatically, or by flight crew selection**

353. The purpose of an air conditioning pack inlet flow valve (pack valve) is to:

**Maintain a constant and sufficient mass air flow to ventilate the cabin and minimise cabin pressure surges**

354. Assuming cabin differential pressure has attained the required value in normal flight conditions, if flight altitude is maintained:

**A constant mass air flow is permitted through the cabin**

355. Cabin pressure is controlled by :

**The outflow valve(s)**

356. During level flight at a constant cabin pressure altitude (which could be decreased, even at this flight level), the cabin discharge valves are:

**Partially open**

357. The purpose of a ditching control is to:

**Close the outflow valve(s).**

358. The cabin pressure is regulated by the:

**Outflow valve**

359. On most large aeroplanes, the cabin pressure is controlled by regulating the:

**Airflow leaving the cabin**

360. Cabin differential pressure means the pressure difference between:

**Cabin pressure and ambient air pressure**

361. Under normal conditions (JAR 25) the cabin pressure altitude is not allowed to exceed:

**8000 ft**

362. Cabin altitude means the:

**Cabin pressure expressed as altitude**

363. On a modern large pressurized transport aircraft, the maximum cabin differential pressure is approximately:

**7 - 9 psi**

364. On most modern airliners the cabin pressure is controlled by regulating the:

**Airflow leaving the cabin**

365. If the maximum operating altitude of an airplane is limited by the pressurized cabin, this limitation is due to the maximum:

**Positive cabin differential pressure at maximum cabin altitude**

366. The "cabin differential pressure" is:

**Cabin pressure minus ambient pressure**

367. The cabin rate of descent:

**Results in cabin pressure increase**

368. The maximum differential pressure of a transonic transport category airplane is approximately:

**9.0 psi**

369. What is the purpose of the pack cooling fans in the air conditioning system?

**Supplying the heat exchangers with cooling air during slow flights and ground operation**

370. The cabin air for modern airplanes is usually supplied by:

**Main engine compressors**

371. In an aircraft air conditioning system of short-haul jet aircraft the air cannot be treated for:

**Humidity**

372. In a bootstrap system, the purpose of the heat exchangers is to:

**Cool bleed air and compressor air from the turbo refrigerator**

373. A warning device alerts the crew in case of an excessive cabin altitude. This warning must be triggered on reaching the following altitude:

**10000 ft (approx. 3000 m)**

374. Environmental system: in the air refrigeration unit, the water separation unit is placed:

**After the cooling turbine**

375. 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:

**P: precools the engine bleed air**

**S: reduces the temperature of the air from the primary exchanger or from the pack's compressor**

376. "Conditioned" air is air that has:

**Been controlled in respect of temperature and pressure**

377. The term "cabin pressure" applies when an aeroplane:

**Has the means to maintain the cabin pressure at a higher level than the ambient pressure**

378. When air is compressed for pressurization purposes, the percentage oxygen content is:

**Unaffected**

379. The term "bootstrap", when used to identify a cabin air conditioning and pressurisation system, refers to the:

**Cold air unit (air cycle machine) arrangement**

380. In a bootstrap cooling system the supply air is:

**Compressed, passed through a secondary heat exchanger, and then across an expansion turbine**

381. In a cabin air conditioning system, equipped with a bootstrap, the mass air flow is routed via the:

**Secondary heat exchanger outlet to the turbine inlet of the cold air unit**

382. Engine bleed air used for air conditioning and pressurization in turbo-jet aeroplanes is usually taken from the:

**Compressor section**

383. The turbine in a cold air unit (air cycle machine):

**Drives the compressor in the unit, creating a temperature drop in the conditioning air**

384. In an air cycle type air conditioning system, reduction of air temperature and pressure is achieved by:

**An expansion turbine**

385. In a "bootstrap" cooling system, the charge air is first compressed in the cold air unit to:

**Ensure an adequate pressure and temperature drop across the cooling turbine**

386. A turbo-fan cold air unit will:

**Cause a pressure drop as well as an associated temperature drop in the charge air**

387. Cabin heating in a large jet transport aeroplane is obtained from:

**Hot air bled from the compressors**

388. The pack cooling fan provides:

**Cooling air to the primary and secondary heat exchanger during slow flight and ground operation**

389. In flight, the most commonly used anti-icing method for the wings of modern commercial aircraft fitted with turbo-jet units is:

**Thermal (use of hot air)**

390. Concerning electrically powered ice protection devices, the only true statement is:

**On modern aeroplanes, electrically powered thermal devices are used to prevent icing on small surfaces (pitot-static, windshield...).**

391. 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 :

**1, 2, 4, 5**

392. Whilst in level cruising flight, an aeroplane with a pressurised cabin experiences a malfunction of the pressure controller. If the cabin vertical speed indicator reads 200 ft/min rate of descent:

**The differential pressure will rise to its maximum value, thus causing the safety relief valves to open**

393. 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:

CAB V/S: Cabin rate of climb indication

CAB ALT: Cabin pressure altitude

DELTA P: Differential pressure

This will result in a:

**CAB V/S increase**

**CAB ALT increase**

**DELTA P decrease**

394. The water separator of an air-conditioning unit is located at the cooling unit:

**Outlet and uses a centrifugal process**

395. If the pressure in the cabin tends to become lower than the outside ambient air pressure the:

**Negative pressure relief valve will open**

396. The pneumatic system accumulator is useful:

**To eliminate the fluid pressure variations**

397. The ice protection system currently used for the most modern jet aeroplanes is the

**Hot air system**

398. During flight, the wing anti-ice system has to protect

**Leading edges, slats and the leading edge flaps**

399. In jet aeroplanes the 'thermal anti-ice system' is primarily supplied by

**Bleed air from the engines**

400. The anti-ice or de-icing system which is mostly used for the wings of modern turboprop aeroplanes is:

**Pneumatic boots**

401. The ice protection for propellers of modern turboprop aeroplanes works

**Electrically**

402. "Conditioned" air is air that has:

**Been controlled in respect of temperature and pressure**

403. A cabin pressure controller maintains a pre-set cabin altitude by regulating the:

**Position of the outflow valve(s).**

404. In a manually operated system, the cabin altitude rate of change is normally controlled by:

**A rate of change selector**

405. The term "Bootstrap", when used to identify a cabin air conditioning and pressurisation system, refers to the:

**Air cycle machine**

406. The pressurisation system of an aeroplane:

**Has the capability to maintain cabin pressure higher than ambient pressure**

407. Under normal flight conditions, cabin pressure is controlled by:

**Regulating the discharge of air through the outflow valve(s)**

408. Assuming cabin differential pressure has attained the required value in normal flight conditions, if flight altitude is maintained:

**A constant mass air flow is permitted through the cabin**

409. Assuming cabin pressure decreases, the cabin rate of climb indicator should indicate:

**A rate of climb**

410. Assume that during cruise flight with air conditioning packs ON, all the outflow valves close:

**The pressure differential would go to the maximum value**

411. The main function of an air cycle machine is to:

**Cool the bleed air**

412. The advantages of thermal anti-icing are:

**1. Simple and reliable system**

**2. Profiles maintained**

~~3. Greater efficiency than that of an electrical resistor~~

~~4. Direct use of the hot air from the jet engine without substantial reduction in engine thrust~~

The combination of correct statements is:

**1,2**

413. 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:

**Low pressure bleed air valve**

414. 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:

**2 - 3**

415. When pressurising the cabin of an aircraft, the cabin pressure controller operates the

**Outflow valve**

416. The engine anti ice system should be used based upon the following information:

**Reported temperature when on ground, and ram air temperature when airborne**

417. A cabin pressurisation system is often installed on board turbine powered aircraft. If installed, it normally has

**Two modes of operation**

418. On Jet aircraft the primary source of compressed air is:

**Bleed air from engine driven compressor**

419. The power source for hot air in de-ice / anti ice systems on jet A/C is:

**Bleed air from the engines' compressor**

420. The air-cycle cooling system produces cold air by:

**Extracting heat energy across an expansion turbine**

421. A complete air-conditioning system includes at least:

**Air cycle machine**

422. Why is the heater combustion chamber in an aircraft pressurisation system completely separated from the ventilating system?

**To prevent any exhaust gases from contaminating the cabin air**

423. Most of the cabin pressurisation systems have two modes of operation:

**The isobaric mode and the constant pressure differential mode**

424. An aircraft climbs and in order to maintain the same cabin pressure during climb, what mode of operation will the pressurisation system make use of?

**Isobaric**

425. The accurate method of removing snow and ice that has accumulated on the aircraft during parking is:

**De-ice all surfaces with approved de-ice fluid**

426. A combustion heater system is normally supplied from by:

**Fuel from the aircraft fuel system**

427. An aircraft with pressurised cabin has maximum cabin altitude of 8000 feet, which equals 10.9 PSI. Present flight altitude is 30.000 feet, which equals 4.36 PSI. Pressure at sea level equals 14.7 PSI. Calculate the difference pressures that influence the cabin structure:

**6.54 psid**

428. Why do the deice boots inflate alternately?

**Alternate inflation of the tubes keeps the disturbance of the airflow to a minimum**

429. The main elements of a vapour cycle cooling system are:

**Reservoir, compressor, expansion valve, evaporator**

430. Essential information whether to use the engine anti-ice system or not, is?

**Reported temperature when on ground, and ram air temperature when airborne**

431. Cabin air for large aeroplanes is usually taken from:

**The HP compressor**

432. On modern jet aeroplanes, where is the compressed air supply obtained from?

**From the HP compressor lower stages (plus higher stages as required)**

433. On turbojet aircraft the primary source of compressed air is:

**Bleed air from an engine driven compressor**

434. The maximum cabin differential pressure of a pressurized aeroplane operating at FL 370 is approximately:

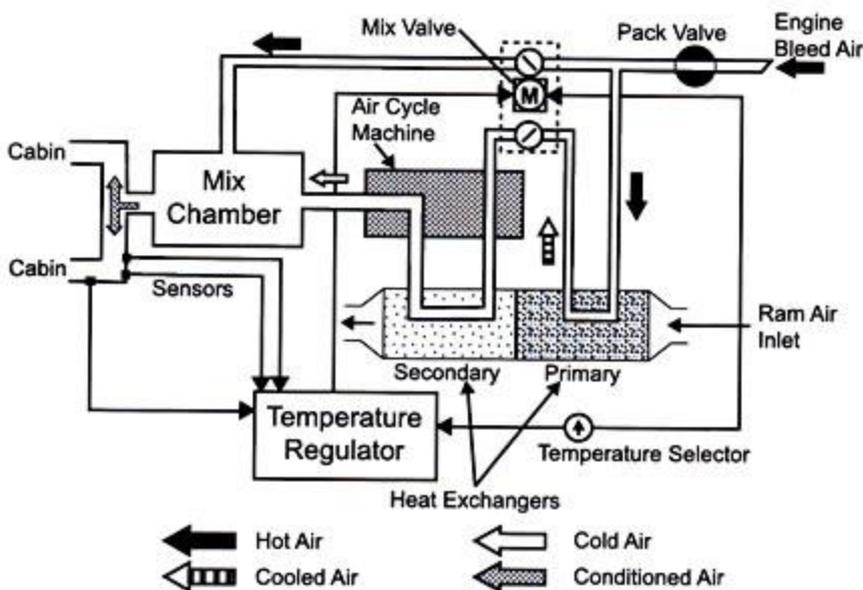
**9,0 psi**

435. What happens to the indications on a cabin VSI, cabin altimeter and differential pressure gauge if an aircraft suffers a decompression?

**VSI up, altimeter up, differential pressure gauge down**

436. Automatic temperature control of the system as shown would be accomplished by:

**The temperature selector in conjunction with cabin sensors and the temperature regulator, modulating the mix valve**



437. A turbo compressor air conditioning system (bootstrap system) will:

**Cause a pressure drop as well as an associated temperature drop in the charge air**

438. Cabin air for a large aeroplane during flight:

**Is temperature controlled**

439. If the automatic control of an air conditioning system fails:

**The pilot can revert to manual control and set the control valve to the required setting**

440. In a turbo compressor air conditioning system (bootstrap system), the main water separation unit is located:

**After the cooling turbine**

441. In a turbo compressor air conditioning system (bootstrap system), the purpose of the heat exchangers is to:  
**Cool the bleed air in front and behind the compressor of the air cycle machine**
442. In an air cycle machine:  
**The turbine drives the compressor of the machine which causes a higher temperature, thus increasing the secondary heat exchanger efficiency**
443. Temperature regulation of an air conditioning system:  
**Is automatically controlled by sensing the output temperature from the control valve in relation to the temperature set on the pilot's control panel**
444. The purpose of an air conditioning pack inlet flow valve (pack valve) is to:  
**Maintain a constant and sufficient air mass flow to ventilate the cabin**
445. In a bootstrap air conditioning system what is the correct sequence describing the routing of the air?  
**Goes through the compressor, secondary heat exchanger, turbine**
446. If the pressure controller malfunctions and the outflow valve malfunctions (remains fully open), what happens to:  
(i) cabin ROC  
(ii) cabin altitude  
(iii) differential pressure  
**(i) increase; (ii) increase; (iii) decrease**
447. If the cabin pressure tends to decrease below ambient:  
**The inward relief valve will open**
448. The turbine in the air conditioning machine:  
**Drives the compressor and creates a temperature drop in the conditioned air**
449. If the discharge valves fail in the closed position in flight, the effect will be:  
**The cabin pressure will rise to maximum differential pressure**
450. The de-humidifier (water separator) is fitted:  
**After the cooling system, and operates on a condensation principle**

451. Determine the maximum operating altitude for an aircraft with a maximum differential pressure of 7,04 psi and a cabin altitude of 4.000 ft from the figure below:

**24.000 ft**

INTERNATIONAL STANDARD ATMOSPHERE

ALTITUDE Feet	TEMPERATURE		PRESSURE				PRESSURE RATIO $\delta=P/P_0$	RELATIVE DENSITY $\delta=\rho/\rho_0$	$\sqrt{\text{DENSITY}}$	SPEED of SOUND kts	ALTITUDE Metres
	°C	°F	mb	PSI	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	0,167	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	21,84	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

452. If during pressurized flight the outflow valve closes fully due to a fault in the pressure controller, the:

**Safety valve opens when the differential pressure reaches structural maximum differential**

453. Why, in the bootstrap system, is the air compressed before it enters the heat exchanger?

**To ensure maximum pressure and temperature drop across the turbine**

454. What is the bootstrap system in cabin pressurisation?

**The low pressure bleed air Cold Air Unit**

455. What is the purpose of the cabin pressurisation system outflow valves?

**To maximize the cabin pressure differential up to cruising altitude**

456. An aircraft with a pressurised cabin has a maximum cabin altitude of 8.000 feet, which equals 10,9 psi. Present flight altitude is 30.000 feet, which equals 4,36 psi. Pressure at sea level equals 14,7 psi.

Calculate the pressure differential:

**6,54 psi**

$10,9 \text{ psi} - 4,36 \text{ psi} = 6,54 \text{ psi}$

457. Generally, for large aeroplanes, electrical heating for ice protection is used on:

**Pitot tubes**

458. Which of the following is true with respect to heating of pitot and static sensors on IFR certified aircraft?

**Pitot tubes are always provided with a heater, while static ports may also be heated**

459. In a bleed air anti-icing system, the areas that are typically heated are:

**The leading edges of the wings and empennage**

460. The power source for hot air in the de-icing/anti-icing system on jet aeroplanes is:

**Bleed air from the engine's compressor**

461. The principle, upon which the vibrating probe (Rosemount) ice detector is based, is:

**Accretion**

462. The purpose of the cabin pressure controller in the automatic mode is to:

1) control cabin altitude

2) control rate of change of cabin altitude

3) limit differential pressure

4) ventilate the cabin

5) keep a constant differential pressure throughout all the phases of flight

The combination that regroups all of the correct statements is:

**1, 2, 3**

463. During a normal pressurised climb after take-off:

**Cabin pressure decreases more slowly than atmospheric pressure**

464. On large pressurised jet transport aeroplanes, the maximum cabin differential pressure is approximately:

**7-9 psi**

465. If the maximum certified altitude of an aeroplane is limited by the pressurised cabin, this limitation is due to the maximum:

**Positive cabin differential pressure at maximum cabin altitude**

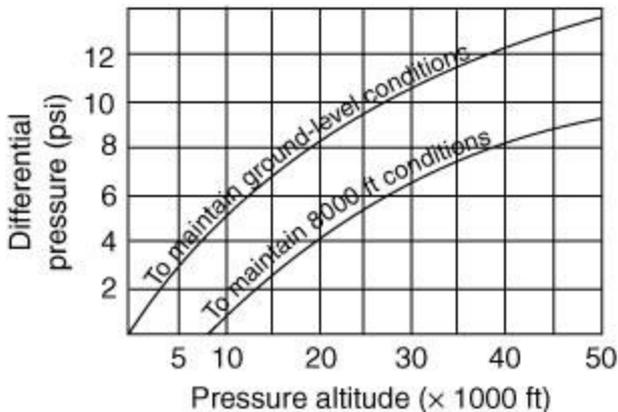
466. The cabin differential pressure is:

**Cabin pressure minus ambient air pressure**

467. The maximum cabin differential pressure of an aeroplane with a maximum certified altitude of 41000 ft is approximately:

**9.0 psi**

The difference between pressure inside and outside the cabin of a pressurized aircraft. The maximum differential pressure that can be maintained is a function of aircraft structure. It is desirable to have cabin pressure as close to the sea level (normally, a cabin pressure corresponding to 6000 to 8000 ft) for the comfort of the passengers and the crew. In the figure, a differential pressure of 13 and 9.25 psi will be required to maintain ground level and 8000-ft conditions, respectively, if the aircraft is at 50,000 ft



468. The purpose of the pack cooling fans in the air conditioning system is to:

**Supply the heat exchangers with cooling air during slow flights and ground operation**

469. In flight, the cabin air for large jet transport aeroplanes is usually supplied by:

**Engine compressors**

470. In a turbo compressor air conditioning system (bootstrap system), the purpose of the heat exchangers is to:

**Cool the bleed air in front of and behind the compressor of the air cycle machine**

471. In an air cycle machine (bootstrap system), the main water separation unit is located:

**After the cooling turbine**

472. 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:

**P: precools the engine bleed air**

**S: cools air behind the pack's compressor**

473. In an air cycle machine (bootstrap system), bleed air downstream of the first heat exchanger is:

**Compressed, passed through the second heat exchanger and then passed across an expansion turbine**

474. On modern transport aircraft, cockpit windows are protected against icing by:

**Electric heating**

475. Usually, electric heating for ice protection is used on:

**Pitot tubes**

476. The heating facility for the windshield of an aircraft is:

**Used on a continual basis as it reduces the thermal gradients which adversely affect the useful life of the components**

477. The correct statement about rain protection for cockpit windshields is that:

**Rain repellent should never be sprayed onto the windshield unless the rainfall is very heavy**

478. In the case of a thermal de-icing system overtemperature, this indicated by:

**Warning lights**

479. The probe heater operates

**Automatically, when the probe detects ice**

480. In order to prevent/eliminate ice buildups on a pitot tube on light aircraft, the pilot can use

**A heating system consisting of an electric resistor inside the tube itself**

481. 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:

**6 ft, aeroplane on the ground, landing gear extended**

482. The number of emergency exits in transport aeroplanes

**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**

483. A manual inflation handle:

**Serves to actuate inflation of a slide when automatic inflation fails**

484. When the door operation of a modern transport aircraft equipped with evacuation slides is controlled from the outside, the slide:

**Is disarmed automatically**

485. The purpose of the proximity of the emergency evacuation path marking system is to:

**Replace the overhead emergency lighting during an emergency evacuation with a thick smoke**

486. An exit is considered to be out of service when the following elements are inoperative the:

1. external door opening mechanism
2. internal door opening mechanism
3. door opening aid device
4. open door locking system
5. auxiliary means of evacuation
6. emergency lighting

The combination regrouping all the correct statements is:

**1, 2, 3, 4, 5, 6**

487. Evacuation slide inflation is ensured by:

**A pressurized gas canister combined with the slide itself**

488. Regarding fire detection, ion detectors are used to detect:

**Smoke**

489. Smoke detector systems are installed in the

**Upper cargo compartments (class E)**

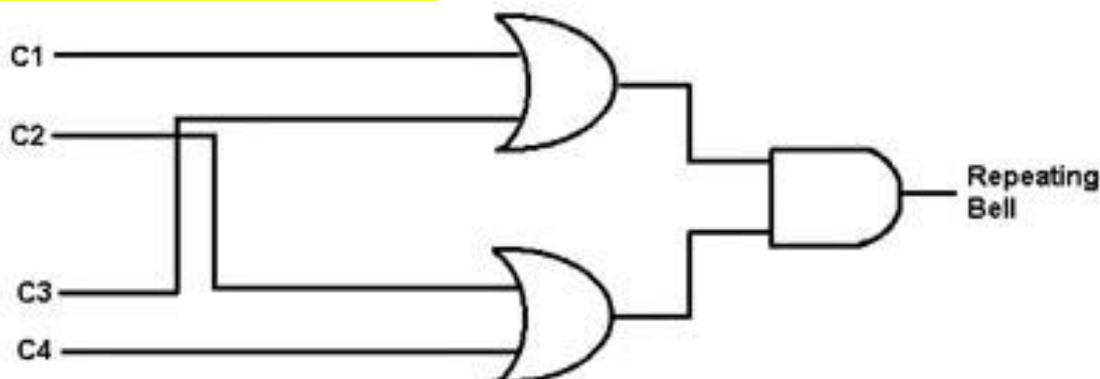
490. Smoke detectors fitted on transport aircraft are of the following type:

**Optical or ionization**

491. 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.

The repeating bell is activated when:

**The C1 and C2 sensors detect smoke**



492. Where are smoke detectors if installed, located in an aircraft?

**In the avionics, lavatory and cargo compartments**

493. What is normally used as a leak detector in an aircraft oxygen system?

**A form of non-oily soap solution**

494. The most common extinguishing agent used in gas turbine engine fire protection system is:

**Halon**

495. 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:

**1, 3**

496. In inflammable gaseous materials, like propan for example, are set on fire; the following extinguisher types should be used for firefighting:

**BCF and CO2 type extinguishers**

497. A fault protection circuit in a fire detection system will:

**Inhibit the fire detector when the detection line is connected to ground**

498. In a fire detection system with single-loop continuous components (with no fault protection), if the line is accidentally grounded:

**The fire alarm is triggered**

499. When a wire type fire system is tested:

**The wiring and the warning are tested**

500. A continuous loop detector is used in a:

**Fire detection system**

501. A gaseous fire loop system is tested by:

**Heating up the sensor**

502. The overheat warning system of a transport aeroplane consists of a warning:

**Light and warning bell**

503. The most suitable extinguishant for use on magnesium fires is:

**Sand**

504. In transport aeroplanes overheat detection systems are installed in the:

**Landing gear bays / wheel wells**

505. The indication of the fire detection systems is performed by a:

**Warning light and a warning bell**

506. Continuous loop fire detector systems operate on the principle that an increase in temperature produces:

**A decrease in resistance**

507. On a multi-engined aircraft a fire detection system includes:

**A warning light for each engine and a single alarm bell common to all engines**

508. An aircraft whose maximum approved passenger seating configuration is 7 to 30 seats must be equipped with at least:

**1 hand fire-extinguisher conveniently located in the passenger compartment**

509. An airplane whose maximum approved passenger seating configuration is 31 to 60 seats must be equipped with at least:

**2 hand fire-extinguishers conveniently located in the passenger compartment**

510. An airplane whose maximum approved passenger seating configuration is 61 to 200 seats must be equipped with at least:

**3 hand fire-extinguishers conveniently located in the passenger compartment**

511. An airplane whose maximum approved passenger seating configuration is 201 to 300 seats must be equipped with at least:

**4 hand fire-extinguishers conveniently located in the passenger compartment**

512. 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 :

**The discharge of fire extinguisher bottle n°1 and illumination of the DISCH (discharge) indicator lamp**

513. Generally, when the fire handle of the fire-extinguishing system of an aircraft is pulled, the effects are :

1) opening of the air bleed valves and HP valves on the engine concerned

2) arming of the extinguishing system

3) immediate discharge of extinguishing agent

4) deactivation of the electric generators

The combination that regroups all the correct statements is:

**2, 4**

514. On an aircraft provided with resistance and capacitance variation type fire detection loops, a fire alarm is initiated by a temperature increase detected:

**At any isolated point of the loops or else generally on all the loops**

515. In order to enable a fire to be controlled as quickly as possible, the fire detectors are located in the highest risk compartments. These compartments are:

1. the main landing gear wheel wells

2. the fuel tanks

3. the oil tanks

4. the auxiliary power unit

5. around the engines

The combination regrouping all the correct statements is:

**1,4,5**

516. In the cockpit of a transport airplane, at least one manual fire-extinguisher must be conveniently located containing:

**Halon**

517. An airplane whose maximum approved passenger seating configuration is 301 to 400 seats must be equipped with at least:

**5 hand fire-extinguishers conveniently located in the passenger compartment**

518. An airplane whose maximum approved passenger seating configuration is 401 to 500 seats must be equipped with at least:

**6 hand fire-extinguishers conveniently located in the passenger compartment**

519. An airplane whose maximum approved passenger seating configuration is 501 to 600 seats must be equipped with at least:

**7 hand fire-extinguishers conveniently located in the passenger compartment**

520. An airplane whose maximum approved passenger seating configuration is greater than 600 seats must be equipped with at least:

**8 hand fire-extinguishers conveniently located in the passenger compartment**

521. An airplane whose maximum approved passenger seating configuration is greater than 60 seats must be equipped with at least:

**3 HALON 1211 fire-extinguishers**

In an aircraft with up to 61 seats, 2 Halon fire extinguishers in the cabin are required. However, the cockpit requires a Halon fire extinguisher as well.

Therefore, a minimum of three is required.

522. In accordance with EU 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:

**Crash axe or a crow-bar in the pilot compartment**

523. In accordance with JAR-OPS 1, an airplane must be equipped with equipment or systems at each emergency exit that allow reaching the ground safely in the case of an emergency when the sill height of the passenger emergency exit is higher than:

**1,83 m**

524. In accordance with EU 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:

**1, 2, 3, 4**

525. In accordance with EU OPS 1, the minimum requirement for the survival oxygen needed to supply 100 % of the passengers during and following an emergency descent is:

**10 minutes or the entire flight time where the cabin pressure altitude is above 15000 ft, whichever is the greater**

526. 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:

**Avoid false alarms in case of vibrations**

527. With engine fire alarm activated, the extinguisher discharge:

**Is the pilot's task**

528. The main feature of BCF fire extinguishers is that they :

**Act as flame inhibitors by absorbing the air's oxygen**

529. What is the main advantage of Halon 1301 over CO2 for extinguishing an aircraft cabin fire?  
**Halon 1301 can extinguish a fire with much lower concentration than is required for CO2, and it will not deprive the occupants of the cabin of the needed oxygen**
530. Aircraft toilets must be fitted with fire extinguishing and smoke-detection systems if the seating capacity is more than:  
**20**
531. The majority of fixed aircraft fire extinguisher systems use:  
**Bromochlorodifluoromethan Halon (1211) extinguishant**
532. The extinguisher in a fixed fire extinguisher system is activated:  
**Electrically**
533. A burst red disc at the atmospheric outlet of a fixed fire extinguisher system indicates:  
**The system is unserviceable**
534. In flight, engine cowlings are fireproofed by:  
**The airflow**
535. Fire from electrical components due to static electricity build up is minimized by:  
**Bonding**
536. When part of a continuous loop fire detection system is heated:  
1) its resistance decreases  
2) its resistance increases  
3) the current increases  
4) the current decreases  
The combination that regroups all of the correct statements is:  
**1, 3**
537. When a continuous loop wire type fire detection system is tested:  
**The wiring and the warning are tested**
538. An engine fire in a large transport aeroplane is indicated by a (n):  
**Visual warning and an aural alert**
539. Halon is used as a fire extinguishing agent because it:  
**Acts as a very effective flame inhibitor**
540. Power plant fire extinguishers are operated by:  
**An electrically fired cartridge rupturing a seal in the head of the bottle**
541. The oxygen masks have dropped down from the passengers' service units. The oxygen flow starts:  
**After pulling the oxygen mask downwards**

542. The purpose of a flight deck oxygen system is to:

1. decrease oxygen pressure from 1800 PSI (in the bottles) down to about 50-75 PSI (low pressure system)
2. supply 100 % oxygen
3. supply diluted oxygen
4. supply oxygen on demand
5. supply oxygen at positive pressure
6. trigger the continuous cabin altitude warning at 10000 ft cabin altitude

The combination that regroups all of the correct statements is:

**2, 3, 4, 5**

543. 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:

**Seats exceeded by 10%**

544. 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:

**14000 ft**

545. Above what flight level must one pilot wear an oxygen mask at all times during commercial flight.

**410**

546. A diluter demand oxygen regulator selected to 100%:

**Delivers oxygen flow when inhaling**

547. A jet aircraft is certified for the carriage of 120 passengers. 42 passengers 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:

**1 passenger for the entire flight after cabin depressurisation at cabin altitude of more than 8000 ft**

548. 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:

**Take-off**

549. In jet transport aeroplanes, oxygen for the flight deck oxygen system is stored as:

**Gases**

550. 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:

**198 (110% of the seating capacity)**

551. In a pressurized transport aircraft, the protective breathing equipment:

**Protects the members of the crew against fumes and noxious gases**

552. When quick donning masks are in use, the pilot is:

**Able to radiotelephone**

553. In a pressurized aircraft, the first-aid (therapeutic) oxygen is designed to:

**Give medical assistance to passengers with pathological respiratory disorders**

554. 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= 230  
Number of seats on board= 200  
Scheduled number of passengers on board= 180  
The minimum number of inhaler systems provided in the aircraft cabin should be:  
**220**

555. The flight level from which regulation requires for the flight crew members in pressurized aircraft a quick donning type mask is:  
**FL 250**

556. What is breathed in when using a passenger oxygen mask?  
**Cabin air and oxygen**

557. The safety precautions to be taken whenever using oxygen are:  
1. refrain from smoking, avoid sparks.  
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:  
**1, 3, 4**

558. The chemical oxygen generator is a system:  
1. which is inexpensive  
2. requiring no external input  
3. which is lightweight  
4. requiring no maintenance  
5. with adjustable flow rate  
6. which is unsafe  
The combination regrouping all the correct statements is:  
**1, 3, 4**

559. The type of a aircraft oxygen system intended for use by passengers, is mostly:  
**A continuous flow system**

560. The demand valve of a diluter-demand type oxygen regulator in normal mode operates when the:  
**User breathes in**

561. The purpose of the "Pressure Relief Valve" in a high pressure oxygen system is to:  
**Relieve overpressure if the pressure reducing valve malfunctions**

562. The state in which the breathing oxygen for the cockpit of jet transport aeroplanes is stored is:  
**Gaseous**

563. If the maximum operating pressure of the oxygen system is exceeded the:  
**Oxygen is discharged overboard via a safety plug**

564. The purpose of a diluter demand regulator in an oxygen system is to:  
**Deliver oxygen flow when inhaling**

565. The built-in passenger oxygen system can be activated by:  
**Switching the passenger oxygen ON**

566. The passenger oxygen mask will supply:

**A mixture of cabin air and oxygen**

567. A pressurized aeroplane is flying at FL 370 and experiences a rapid decompression. Which of the following statements is correct about the oxygen system?

**The oxygen masks are automatically presented to cabin crew members and passengers**

568. A substance which may never be used in the vicinity or on parts of an oxygen installation is:

**Grease**

569. Regarding the chemical oxygen generator, to enable the oxygen to flow, the passenger must:

**Firmly pull the mask towards his face**

570. The chemical oxygen generator supplies oxygen for about:

**15 minutes**

571. 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:

**1, 2, 4, 6**

572. 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:

**1, 3, 5**

573. 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:

**1, 3, 5**

574. The purpose of the first aid oxygen is to:

**Provide some passengers with additional respiratory assistance after an emergency descent following a depressurization**

575. 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:

**2,3**

576. 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.~~

4. an emergency in the case of smoke or toxic gases.

The combination regrouping all the correct statements is:

**1,4**

577. Modern pressurized transport airplanes are equipped with:

**Two independent oxygen systems, one supplying the cockpit, the other the cabin**

578. When selected to normal, the oxygen proportion of the air/oxygen mixture supplied by the cockpit oxygen system regulator:

**Increases when the altitude increases**

579. In the cabin, when the oxygen mask is pulled downwards, the passenger breathes:

**A mixture of oxygen and cabin air**

580. Chemical oxygen generators are used to furnish oxygen to the:

**Cabin only**

581. The survival oxygen is:

**The oxygen supplied to the airplane occupants in case of accidental depressurization**

582. The equipment of an oxygen supply installation must be kept absolutely free of oil or grease traces as:

**These substances catch fire spontaneously in the presence of oxygen under pressure**

583. 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:

**1, 2**

584. A passenger emergency mask is a:

**Continuous flow mask and cannot be used if there is smoke in the cabin**

585. A smoke mask is a :

**Mask with flow on request and covers the whole face**

A smoke hood shall be used in situations where smoke or gases make breathing difficult or impossible and can be used both during fire fighting and during evacuation after an emergency landing. It consists of a heat protection hood that also covers the chest, an oxygen generator, a starter and a strap around the waist. The oxygen generator produces oxygen and removes the exhaled carbon dioxide and water vapour of the users. The generator is carried on the chest. When pulling the starter, the generator starts and the hood is immediately filled with oxygen. However, if you forget to pull the starter after putting on the smoke hood, the oxygen generator will automatically begin to deliver oxygen after two or three breaths.

Most smoke hoods deliver oxygen for approximately 20 minutes. The oxygen production is demand regulated, i.e. an increase of the workload leads to an increase of the volume of generated oxygen and vice versa. This means that if the workload is low, the oxygen supply will last for more than 20 minutes. It also means that the oxygen generation will stop if you take off your smoke hood and will start again when you put it on at a later time. When the oxygen supply is close to be emptied, a higher breathing resistance is felt.

586. 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:

**10000 ft**

587. 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:

**13000 ft**

588. 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:

**10000 ft but not exceeding 13000 ft minus 30 minutes**

589. 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:

**Seats by 10 %**

590. Airliners are equipped with oxygen systems. It can be said that:

**With setting on "NORMAL", the crew breathes a mixture of oxygen / cabin air**

591. An oxygen regulator has 3 controls:

- a power lever : ON/OFF
- an "O2" lever : NORMAL/100%
- an emergency lever : ON/OFF

Among the following statements, the correct proposition is:

**The power lever 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**

592. In case of smoke in the cockpit, the crew oxygen regulator must be set to:

**100%**

593. The installation and use of on-board oxygen generators is such that:

**1 - the smoking ban is imperative when used**

~~2 - in case of accidental drop of the "continuous flow" passenger masks, no crew action is required~~

**3 - no trace of grease must be found in the system assembly**

~~4 - the system's filling adaptors must be greased with non-freezable or graphite grease~~

The combination which regroups all of the correct statements is:

**1 - 3**

594. Oxygen regulators used by the flight crew for most commercial jet aircraft are of the

**Diluter demand type**

595. The type of a aircraft oxygen system intended for use by passengers, is mostly:

**A continuous flow system**

596. Fixed oxygen systems in pressurised aeroplanes are used to provide oxygen:

**1) in the event of depressurisation**

~~2) in the event of any passenger indisposition~~

~~3) during a normal flight~~

**4) in the event of smoke or toxic fumes in the cockpit**

The combination that regroups all of the correct statements is:

**1, 4**

597. The number of hand fire extinguishers which have to be installed in the passenger cabin according to JAR-OPS depends on the number of:

**Seats in the cabin**

598. The crash/fire axe is part of the safety equipment fitted to passenger aircraft. Its function is to:

**Obtain forced access to a fire behind a panel and a general purpose tool during evacuation**

599. In a ditching situation, the passenger life jackets will be inflated:

**When leaving the airplane**

600. 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:

**60 life jackets and three 30-seat life boats**

601. 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:

**1 megaphone**

602. 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:

**2, 3**

603. The number of manual fire-extinguishers, on board the passenger cabin of an airplane, whose maximum approved configuration for passenger seats is 31, is:

**2**

604. The number of crash axes on board an airplane, whose maximum approved configuration of passenger seats is 201, is:

**2**

605. An aircraft whose maximum approved configuration for passenger seats is 10 seats must be equipped with:

**One fire extinguisher only in the cockpit**

606. 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:

**10 minutes**

607. An aircraft whose maximum approved configuration for passenger seats is 200 seats must be equipped with:

**3 manual fire-extinguishers in the cabin**

608. The pyrotechnic means used in case of an emergency to indicate your position to the emergency teams are a flare:

**Which is used at night and a smoke device which is used in the daytime**

609. The portable emergency beacons which are used after an emergency landing or ditching have duration of:

**48 h**

610. In accordance with JAR-OPS 1 and if necessary, the number of life rafts to be found on board an aircraft must allow the transportation of the entire aircraft occupants:

**In the case of a loss of one raft of the largest rated capacity**

611. A public transport passenger's aircraft, with a seating configuration of more than 61 seats, must have in its passenger compartment(s), at least 3 portable fire-extinguishers including:

**2 halon fire-extinguishers**

612. How many megaphones are required in an airplane with a maximum approved passenger seating configuration of 85 seats and only 5 passengers on board?

**1**

613. How many megaphones are required in an airplane with a maximum approved passenger seating configuration of 165 seats and only 5 passengers on board?

**2**

614. How many megaphones are required in an airplane with two passenger decks and a maximum approved seating configuration of 50 seats on the lower deck and 15 seats on the upper deck, with a total of 28 passengers on board?

**1**

615. The colour of a fresh synthetic hydraulic fluid is:

**Purple**

616. Assuming cabin differential pressure has reached the required value in normal flight conditions, if flight altitude and air conditioning system setting are maintained:

**The mass air flow through the cabin is constant**

617. The wing anti-ice system has to protect

**The leading edge or the slats, either partially or completely**

618. The sequential pneumatic impulses used in certain leading edge de-icing devices:

1) Prevent ice formation

2) Can be triggered from the flight deck after icing has become visible

3) Will inflate each pneumatic boot for a few seconds

4) Will repeat more than ten times per second

The combination that regroups all of the correct statements is:

**2, 3**

619. Which of these statements about an anti-skid system are correct or incorrect?

1) In case of failure of an anti-skid system the auto-brake system takes over the regulation of the slip ratio

2) Careful brake application by the pilot in case of anti-skid failure can never achieve the same performance as a properly functioning anti-skid system

**1) is incorrect, 2) is correct**

620. The auto-brake system is switched off during or after landing by:

**positioning the auto-brake selector to DISARM or OFF**

621. Which of these statements about an auto-brake system are correct or incorrect?

1) An auto-brake system can function properly, even when the anti-skid system is inoperative

2) In the RTO mode maximum anti-skid braking is applied

**1) is incorrect, 2) is correct**

622. When landing is performed with an auto-brake system selected to a high deceleration level:

**This deceleration level may not be constant when the runway has local slippery spots**

623. In normal operation the maximum cabin altitude for transport aeroplanes is:

**8000 ft**

624. According JAR/CS 25 the worst effect of a major failure on the flight crew could be

**Physical discomfort or a significant increase in workload**

625. According JAR/CS 25 the worst effect of a minor failure on the aeroplane could be:

**Slight reduction in functional capabilities or safety margins**

626. In a commercial transport aeroplane the landing normal gear operating system is usually:

**Hydraulically driven**

627. During hydroplaning, the friction coefficient between tyre and runway surface is approximately:

**0**

628. Which of these statements about an auto-brake system are correct or incorrect?

**1) Proper functioning of an auto-brake system requires proper functioning of the anti-skid system**

~~2) In the RTO mode a maximum constant deceleration is applied~~

**1) is correct, 2) is incorrect**

629. Which of these statements about an auto-brake system is correct?

**On most aeroplanes the auto-brake system provides a constant deceleration during landing on a dry runway (ignoring possible transition effects when the system begins to function)**

630. Pneumatic mechanical ice protection systems are mainly used for:

**Wings**

631. Pneumatic mechanical devices that provide ice protection:

**Are usually used as de-icing devices**

632. On most transport aircraft, flight deck windows are protected against icing by:

**Electric heating**

633. The wing ice protection system currently used on most modern jet aeroplanes is a:

**Hot air system**

634. The wing anti-ice system has to protect

**The leading edge or the slats, either partially or completely**

635. The anti-ice or de-icing system which is mostly used for the wings of modern turboprop aeroplanes is:

**Pneumatic boots**

636. The ice protection for propellers of most turboprop aeroplanes works:

**Electrically**

637. With regard to an aircraft structure, "fail safe" is one:

**In which the load is carried by other components if a part of the structure fails**

638. The anti-icing method for the wings of large jet transport aeroplanes most commonly used in flight is:

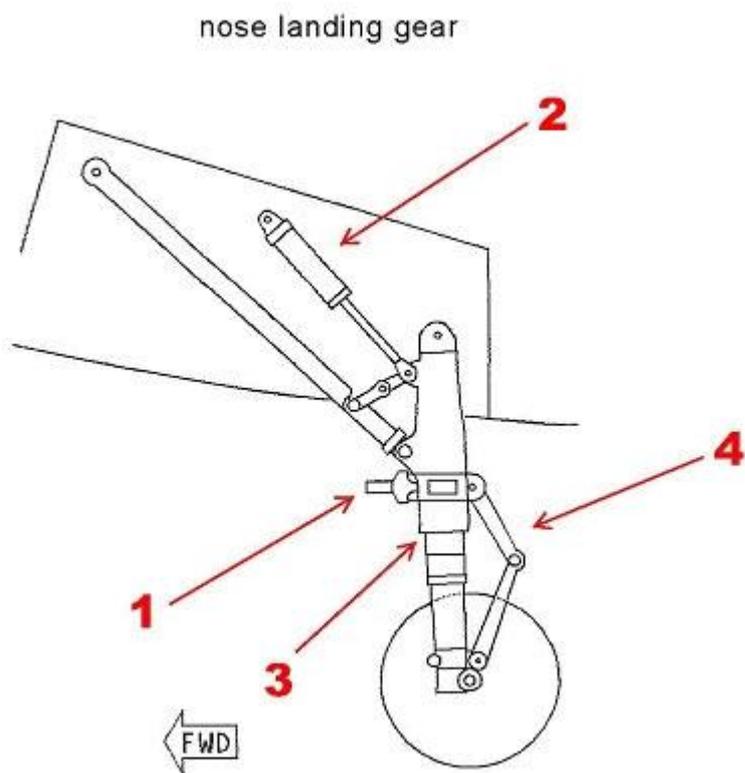
**Thermal (use of hot air)**

639. An under-inflated tyre will:

**Experience increase wear at the shoulders**

640. Which part of the nose landing gear is shown by the number 3?

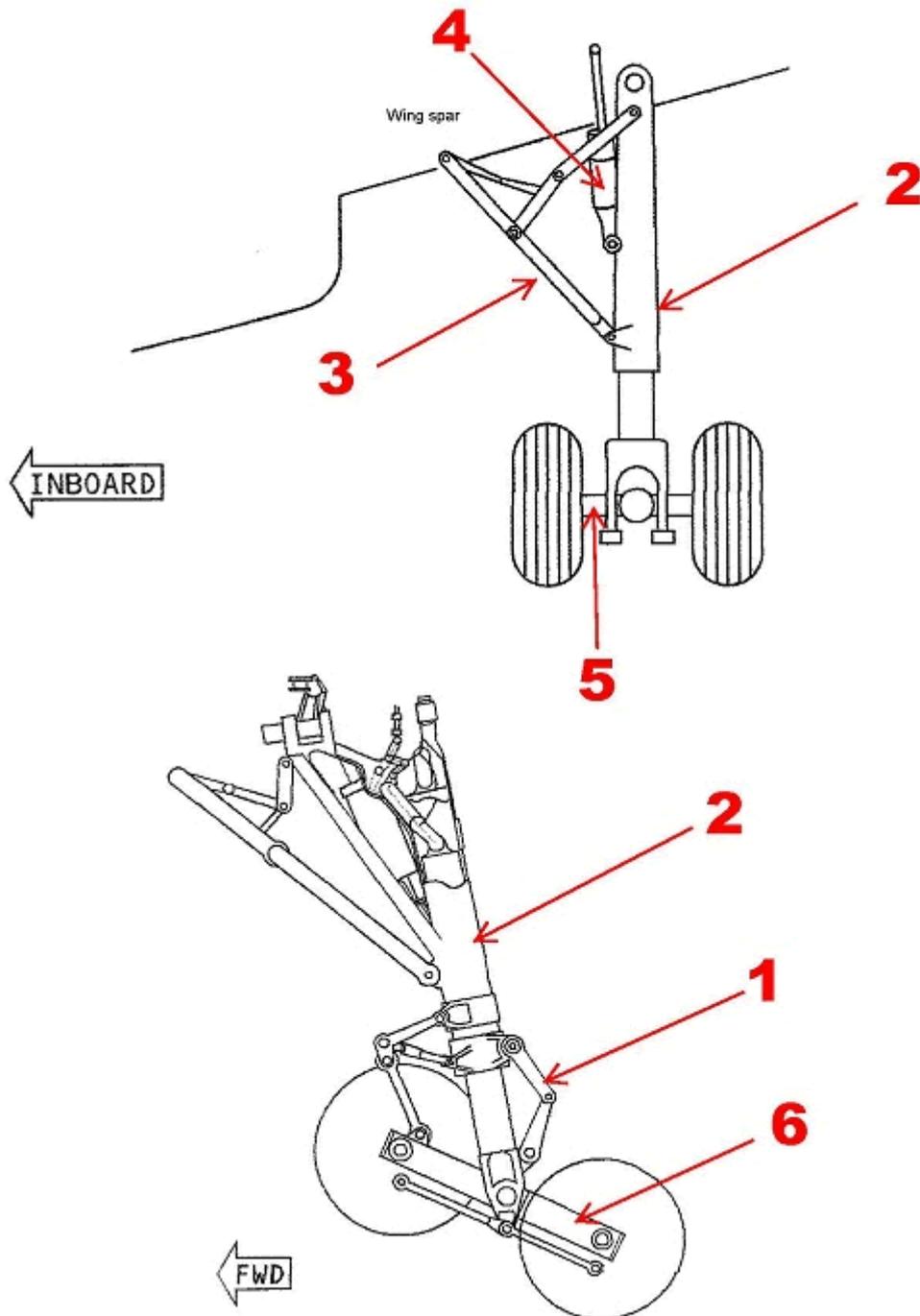
**Shock absorber**



641. Which part of the main landing gear is shown by the number 5?

**Axle**

### main landing gear



642. Which of these statements about trimming in a irreversible flight control system of a conventional aeroplane are correct or incorrect?

1) The zero force position of the control column changes when using the elevator trim

2) The zero force position of the control wheel changes when using the aileron trim

**1) is incorrect 2) is correct**

643. Which of these statements concerning a sandwich structural part are correct or incorrect?

1) A sandwich structural part consists of two thin sheets enclosing a light core material

2) A sandwich structural part is not suitable for absorbing concentrated loads

**1) is correct, 2) is correct**

644. When a wing bends upwards, aileron flutter might occur if the aileron deflects:

**Downwards, because the location of the aileron centre of gravity lies behind the hinge line**

645. The highest load on the torsion link in a bogie gear is:

**Whilst turning on the ground with a small radius**

646. The use of a hot air wing anti-icing system:

**Does not affect aerodynamic performance of the wing and causes a reduction in maximum thrust**

647. The ice protection system currently used for most large turboprop aeroplanes is a:

**Pneumatic system with inflatable boots**

648. Windshield heating of a transport aeroplane is:

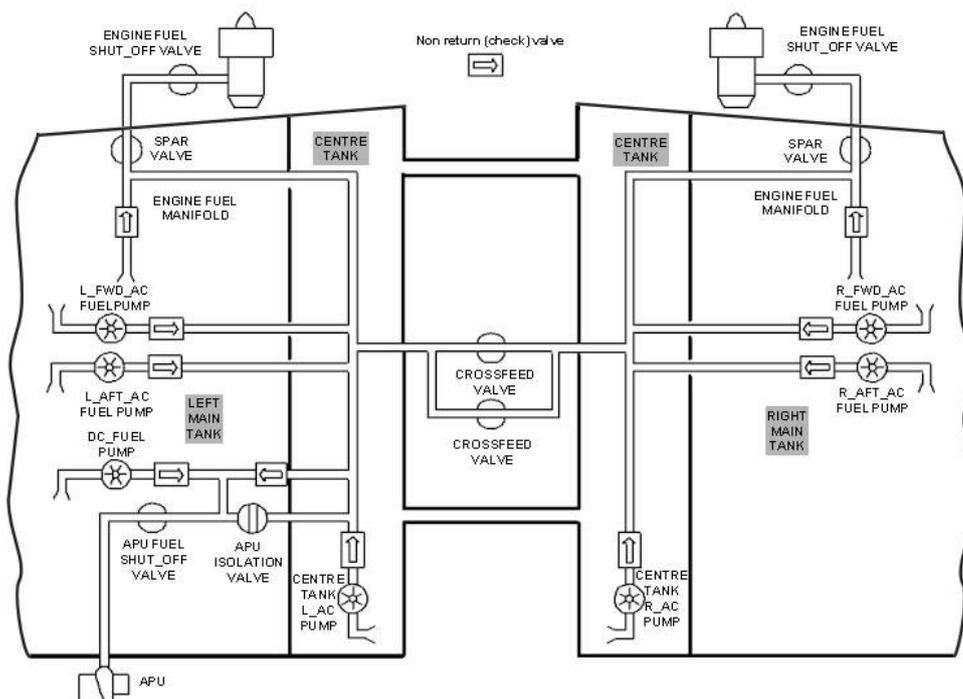
**Essential to improve the strength of the cockpit windows**

649. Which of these statements about the fuel system depicted in the graph are correct or incorrect?

1) If the AC fuel pumps are not running in the system configuration shown, it is still possible to feed both engines from the main tanks

2) In the system configuration shown the DC fuel pump can supply fuel to the engines

**1) is correct, 2) is incorrect**



650. Which of these statements about the fuel system depicted in the graph are correct or incorrect?

1) If the AC fuel pumps are not running in the system configuration shown, it is still possible to feed both engines from the main tanks

2) If the APU isolation valve opens, the APU fuel shut off valve is closed and there is no AC power, the DC fuel pump can supply fuel to the engines

**1) is correct, 2) is correct**

651. Given the system depicted in the graph, which of these statements about this fuel system is correct?

**It is impossible to transfer fuel from the centre tank to the wing tanks**

652. Given the system depicted in the graph, which of these statements about cross feeding is correct?

**Fuel supply is possible from any tank to any main engine**

653. Given the system depicted in the graph, the main purpose of the DC fuel pump in the left main tank is to:

**Supply fuel to the APU**

654. Given the system depicted in the graph with all tanks containing fuel, the APU can receive fuel from:

**All tanks**

655. The Number in the graph that shows the axle is:

**5**

656. The Number in the graph that shows the retraction actuator is:

**4**

657. The Number in the graph that shows the side stay/strut is:

**3**

658. The Number in the graph that shows the main leg oleo strut is:

**2**

659. The Number in the graph that shows the torsion link is:

**1**

660. Which part of the main landing gear is shown by the number 4?

**Retraction actuator**

661. Which part of the main landing gear is shown by the number 3?

**Side stay/strut**

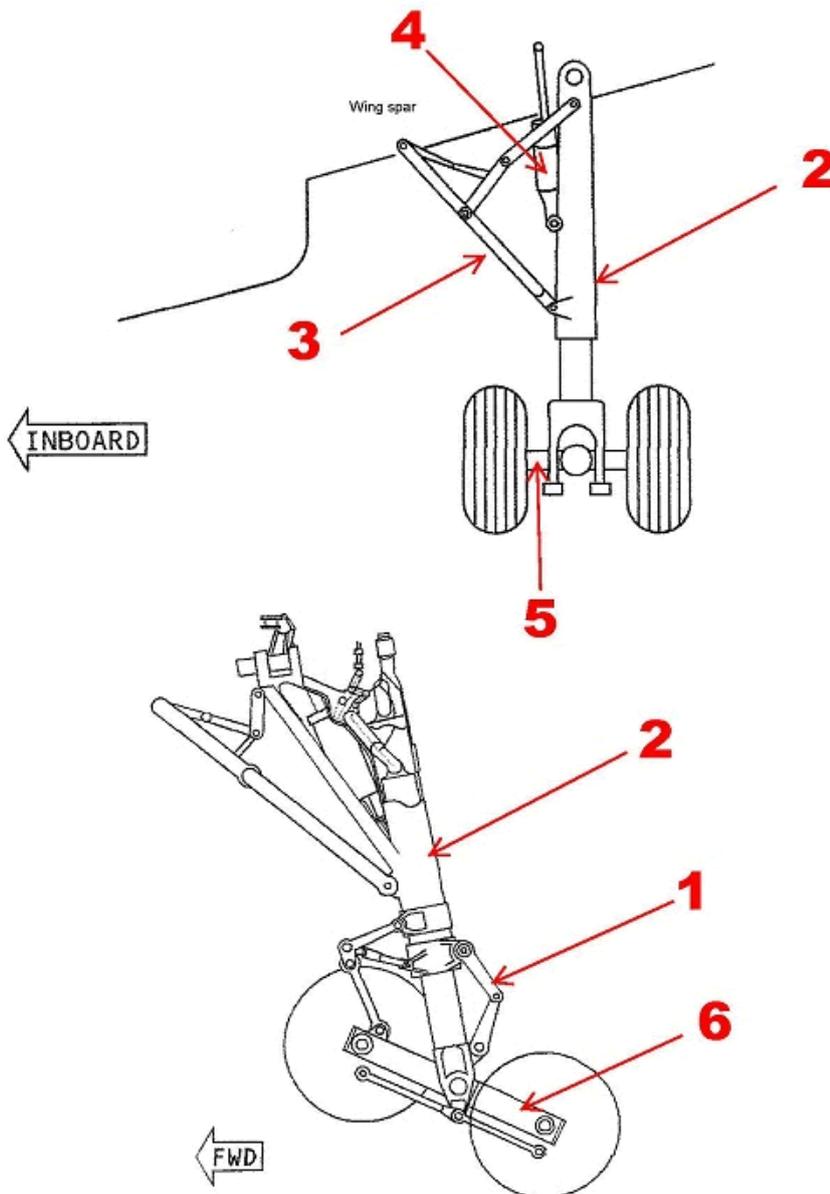
662. Which part of the main landing gear is shown by the number 2?

**Main leg oleo strut**

663. Which part of the main landing gear is shown by the number 1?

**Torsion link**

## main landing gear



664. The failure of an anti-skid system:

**At least doubles the minimum braking distance on a dry runway**

665. The failure of an anti-skid system:

**Always increases the minimum braking distance irrespective of runway condition**

666. Which of these statements about an anti-skid system are correct or incorrect?

1) In case of failure of an anti-skid system the auto-brake system takes over the regulation of the slip ratio

2) Careful brake application by the pilot in case of anti-skid failure can never achieve the same performance as a properly functioning anti-skid system

**1) is incorrect, 2) is correct**

667. Which of these statements about an anti-skid system are correct or incorrect?

1) The "regulation of slip ratio" function of an anti-skid system ensures optimum braking performance

2) Careful brake application by the pilot in case of anti-skid failure can achieve the same performance as a properly functioning anti-skid system

**1) is correct, 2) is incorrect**

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**1) is correct, 2) is correct**

670. Which of these statements about rudder pedal nose wheel steering is correct?

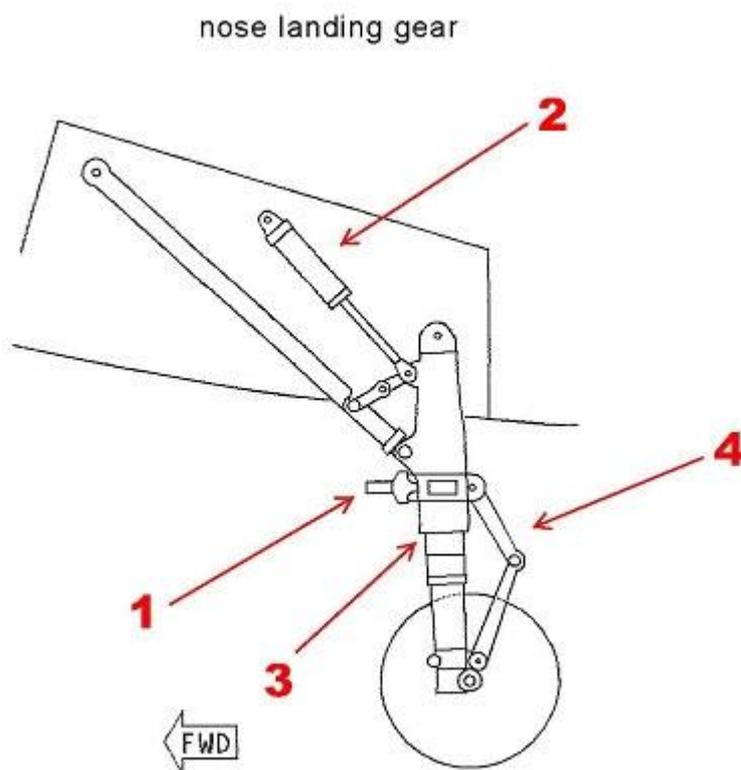
**Rudder pedal nose wheel steering functions on the ground only**

671. Which of these statements about rudder pedal nose wheel steering is correct?

**Rudder pedal nose wheel steering provides a smaller deflection of the nose wheel as hand wheel steering (tiller)**

672. The number in the graph that shows the torsion link is:

**4**



673. The number in the graph that shows the shock absorber is:

**3**

674. The number in the graph that shows the retraction actuator is:

**2**

675. The number in the graph that shows the steering actuator is:

**1**

676. Which of these statements about rudder pedal nose wheel steering of a jet transport aeroplane is correct?

**Manual or tiller nose wheel steering offers a larger maximum deflection of the nose wheel as rudder pedal nose wheel steering**

677. Which of these statements about rudder pedal nose wheel steering of a jet transport aeroplane is correct?

**Rudder pedal nose wheel steering offers a smaller maximum deflection of the nose wheel as tiller nose wheel steering**

678. Which of these statements about an auto-brake system are correct or incorrect?

1) An auto-brake system can function properly, even when the anti-skid system is inoperative

2) In the RTO mode maximum anti-skid braking is applied

**1) is incorrect, 2) is correct**

679. Which of these statements about an auto-brake system are correct or incorrect?

1) Proper functioning of an auto-brake system requires proper functioning of the anti-skid system

2) In the RTO mode a maximum constant deceleration is applied

**1) is correct, 2) is incorrect**

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1) Proper functioning of an auto-brake system requires proper functioning of the anti-skid system

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**1) is correct, 2) is correct**

682. When the auto-brakes are armed before landing one condition for the system to start operating is:

**Main wheel spin-up**

683. At the end of a rejected take-off performed with an auto-brake system with the setting RTO:

**The brakes will lock the wheels**

684. Which of these statements about an auto-brake system is correct?

**The achievable deceleration levels of full manual braking and the auto-brake RTO mode are the same**

685. Which of these statements about an auto-brake system is correct?

**When using manual braking during taxiing, the auto-brake system remains armed**

686. Which of these statements about an auto-brake system is correct?

**When a low auto-brake setting is used during landing use of reverse thrust reduces the brake temperature**

687. Which of these statements about an auto-brake system is correct?

**On most aeroplanes the auto-brake system provides a constant deceleration during landing on a dry runway (ignoring possible transition effects when the system begins to function)**

688. When landing is performed with an auto-brake system selected to a high deceleration level:

**This deceleration level may not be constant when the runway has local slippery spots**

689. During taxiing before take-off the normal auto-brake system selection before take-off is made. Immediately afterwards, but still before commencement of the take-off, heavy braking is applied. This causes the auto-brake system:

**To remain in the selected mode**

690. The auto-brake system is switched off during or after landing by:

**Positioning the auto-brake selector to DISARM or OFF**

691. The auto-brake system is disarmed or switched off after touch-down by:

**Application of manual braking**

692. How will the auto-brake system respond when a landing is performed with the system armed and the pilot presses the brake pedals after landing?

**The system switches to DISARMED or OFF**

693. Which of these statements about an auto-brake system are correct or incorrect?

~~1) During landing and rejected take-off auto-brakes stop operating and disarm below a certain low speed~~

~~2) During landing auto-brakes keep operating when idle reverse thrust is selected~~

**1) is incorrect, 2) is correct**

694. Which of these statements about an auto-brake system are correct or incorrect?

~~1) During landing and rejected take-off auto-brakes keep operating until the pilot presses the brake pedals~~

~~2) During landing auto-brakes stop operating and disarm when reverse thrust is selected~~

**1) is correct, 2) is incorrect**

695. Which of these statements about an auto-brake system are correct or incorrect?

~~1) During landing and rejected take-off auto-brakes stop operating below a certain low speed~~

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~~2) During landing auto-brakes keep operating when idle reverse thrust is selected~~

**1) is correct, 2) is correct**

697. The auto-brake system stops operating during landing:

**By the pilot pressing the brake pedals**

698. Which of these statements about an auto-brake system (ABS) is correct?

**When the pilot forgets to arm the auto-brake system, this will not generate a take-off warning during take-off**

699. Which of these statements about an auto-brake system (ABS) is correct?

**Without pilot interference an auto-brake system continues to operate until standstill**

700. Which of these statements about an auto-brake system (ABS) is correct?

**An armed auto-brake system at low settings will start operating with a certain time delay after main wheel touchdown**

701. Which of these statements about an auto-brake system (ABS) is correct?

**For a given touchdown speed (GS) on a dry runway without use of reverse thrust the stopping distance is solely dependent on the selected ABS setting and independent of weight**

702. Which of these statements about an auto-brake system during RTO (Rejected Take Off) is correct?

**Without pilot interference an auto-brake system continues to operate until standstill**

703. Which of these statements about an auto-brake system during RTO (Rejected Take Off) is correct?

**In the RTO mode maximum anti-skid braking is applied**

704. Which of these statements about an auto-brake system during RTO (Rejected Take Off) is correct?

**Using the RTO mode provides the best stopping performance during a rejected take-off**

705. For aircraft equipped with a landing gear anti retract latch, which of these statements is correct?

**This system can be overridden under specified conditions**

706. An anti-retract latch blocks the landing gear lever when:

**An aircraft is on the ground**

707. In transport aircraft equipped with retractable landing gear, there must be a clear indication to the pilot:

**Whenever the landing gear position is not consistent with landing gear selector lever position**

708. Which of these statements about rudder pedal nose wheel steering of a jet transport aeroplane is correct?

**When performing a rudder check during taxiing, an additional pilot action to avoid deflection of the nose wheel**

709. Which statement about the auto-brake and anti-skid system is correct?

**The auto-brake system can no operate without a properly operating anti-skid system**

710. The highest load on the torsion link in a bogie gear is:

**Whilst turning on the ground with a small radius**

711. In transport aircraft equipped with retractable landing gear, an aural alert must be given to the pilot:

**Whenever a landing is attempted and any gear is not locked down**

712. The number in the graph that shows the bogie beam is:

**6**

main landing gear

