1. 'Fail safe construction' is:

a) A simple and cheap type of construction.

b) **A type of construction in which the load is carried by other components if part of**

**the structure fails**.

c) A type of construction for small aircraft only.

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

a) The amount of free movement of the nose wheel before steering takes effect.

b) **A possibly damaging sinusoidal movement of the nose wheel when moving on**

**the ground**.

c) The oscillatory movement of the nose wheel when extended prior to landing.

3. A 'Q' pot can be referred to as a force gradient unit which is used to:

a) Indicate the pitch angle on the stall warning indicator

b) Prevent pilot inputs overriding auto-pilot inputs.

c) **Add artificial feel into a hydraulically powered flight control system**.

4. A cantilever wing:

a) Has both an upper and lower aerofoil section

b) Folds at the root section to ease storage in confined spaces

**c) Is supported at one end only with no external bracing**

5.. A torsion box:

a**) Is a structure formed between the wing spars, skin and ribs to resist bending and**

**twisting loads**

b) Is a structure within the wing for housing the fuel tanks, flight controls and landing

gear

c) Is a structure designed to reduce the weight

6. Control surface flutter is minimised by:

a) Changing the wings before they reach their critical life

**b) Mass balance of the control surface**

c) Aerodynamic balance of the control cables

7. If an artificial feel unit is fitted it would be connected

a) In series with the secondary controls

b) In parallel with the secondary controls

**c) In parallel with the primary controls**

8. If an elevator trim tab is moved to its full nose up trim position the pitch control

available with full up elevator will be:

a) Increased

**b) Reduced**

c) Reversed

9. If the control column is moved backwards and to the left

a) The elevator moves up, the left aileron moves down and the right aileron moves

up.

b) **The elevator moves up, the left aileron moves up and the right aileron moves**

**down.**

c) The elevator moves down, the left aileron moves up and the right aileron moves

down.

10. In a stressed skin airframe structure for a pressurised aircraft:

**a) The rivets are under shear loads and the skin is under tensile loads**

b) The rivets take a shear load and the skin is under compressive loads

c) The rivets and skin are under compressive loads

11. In the construction of a pressurised aircraft fuselage structure the primary purpose of

frames or formers is to:

a) Provide a means of attaching the stringers and skin panels

**b) Oppose hoop stresses and provide shape and form to the fuselage**

c) Form the entrance door posts

12. Krueger flaps are fitted

a) On the wing leading edge close to the tip

b) **On the wing leading edge close to the root**

c) On the wing trailing edge close to the tip

13. On a non-stressed skin type wing the wing structure elements which take up the

vertical bending moments are:

a) The webs.

b) The ribs.

c) **The spars.**

14. On an aeroplane spoilers are:

a) Lower wing surface devices their deflection is always asymmetrical.

b) Lower wing surface devices their deflection is symmetrical or asymmetrical.

c) **Upper wing surface devices their deflection is symmetrical or asymmetrical.**

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15. . On an aircraft with differential ailerons:

a) **The upward moving aileron moves through a greater angle than the downward**

**moving aileron**

b) The leading edge of the upward moving aileron projects below the wing

c) Both of the ailerons move down when the flaps are lowered

16. On an aircraft with variable incidence trimming tailplane the tailplane incidence

changes:

a) Automatically if the elevator moves

b) By re-setting it on the ground

c) **If the trim wheel is turned backwards or forwards**

17. On an airplane the Krueger flaps are:

a) Trailing edge flaps close to the wing root

b) Leading edge flaps close to the wing tip

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

18. Spoilers on the upper wing surface may be used:

a) To augment the lift

b) **As lift dumpers during the landing run**

c) To give control in pitch

19. Station numbers (Stn) and water lines (WL) are:

a) **A means of locating airframe structure and components**

b) Runway markings for guiding the aircraft to the terminal

c) Compass alignment markings

20. 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 of correct statements is:

a**) 3 and 5**

b) 1 and 2

c) 1 and 5

21. The airframe structure must remain substantially intact after experiencing:

a) The design limit load plus the design ultimate load

b) **The design limit load times a 1.5 safety factor**

c) Three times the safety factor

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

a**) Integrate the strains due to pressurization to which the skin is subjected and**

**convert them into a tensile stress**.

b) Assist the skin in absorbing the longitudinal traction-compression stresses.

c) Withstand the shear stresses.

.

23. The purpose of the primary stops in a flying control system is to:

a) Act as a stop in case of vibration of the controls

b) **Restrict the movement of the controls within the correct range**

c) Prevent damage to the system when the helicopter is parked in high winds

24. The reason for the fact that an aeroplane designed for long distances cannot simply

be used for short haul flights at higher frequencies is that

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

**spectrum**

b) These aeroplanes often consume too much fuel on short haul flights.

c) The procedures and checklists for these kinds of aeroplanes will take too much

time

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

switches is

a) Because there are two trim motors.

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

c) To prevent both pilots performing opposite trim inputs.

26. What is the purpose of stringers:

a) To support the primary control surfaces

b) To produce stress rises and support the fatigue meters

**c) To prevent buckling and bending by supporting and stiffening the skin**

27. A divided wheel designed for a tubeless tyre

a) Is constructed from one piece of metal and has no seams

b) Must be joined with a liquid sealant

c) **Has a rubber seal between to provide an airtight joint**

28. A likely cause of nose wheel shimmy is:

a) The aircraft is incorrectly loaded

b**) A torque link is worn or damaged**

c) The tyre pressures are too high

29. A main landing gear unit is prevented from collapsing on the ground by:

**a) A system of lateral bracing struts geometric lock and down lock**

b) Selector solenoid lock

c) Hydraulic pressure

30. A nosewheel steering control system:

a) Prevents the nose gear from lowering if the nosewheels are not centralised

b) **Allows the nosewheel to castor within preset limits when in the neutral position**

c) Allows the nosewheel to castor freely at all times

31.. A red 'config' warning light and an aural warning can occur during the approach

phase. This is to inform the pilot that:

a) The normal landing gear extension system has failed.

b) **A combination of altitude flap position and/or airspeed is below safe operating**

**limits with the landing gear retracted**.

c) The stabiliser trim system has failed.

.

32. A red light on an undercarriage position indicator signifies:

a) **At least one wheel is in the traveling or unlocked condition**.

b) All wheels are up and locked.

c) The landing has been selected down using the emergency extension system.

33. A restrictor valve is fitted in the UP line of a hydraulic retraction system to:

a) Prevent the hydraulic fluid becoming overheated

b) Prevent the hydraulic fluid becoming aerated

**c) Restrict the rate of gear extension**

34. A torsion link assembly is installed on the landing gear to:

a) Control the wheels.

b**) Avoid rotation of the piston rod relative to the gear oleo strut**.

c) Lock the landing gear.

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35. After take off from a runway contaminated with slush

a) **The landing gear should be exercised up and down**

b) The landing gear should be retracted as soon as possible

c) The gear should remain extended for the whole flight

36. At an aircraft taxiying speed of 10 kts the anti-skid braking system is:

a**) Inoperative**

b) Operative

c) Operative only on the main wheel brakes

d) Operative only on the nosewheel brakes

37. Creep (Slippage):

a) May cause excess wear

b) Can damage the braking system

**c) Can be measured by painting marks on the tyre and wheel rim**

38. Excessive wear on the crown of the tyre can be caused by:

a) Under inflation

b) High approach speeds

c) **Over inflation**

39. Fusible plugs are fitted in aircraft wheels to:

a) **Allow a controlled deflation of the tyre in the event of excessive temperatures**

b) Allow the tyre pressure to be corrected for temperature

c) Allow a controlled deflation of the tyre in the event of it being over inflated

40. Generally on modern jet transport aircraft how can the landing gear be extended if

there is a complete hydraulic system failure.

a) By hydraulic accumulators after unlocking the up locks by mechanical or

electrical means.

b) Using electrically driven actuators.

**C) By gravity after unlocking the up locks by mechanical or electrical means**

41. In some aircraft there is a protection device to avoid the landing gear being

inadvertently retracted on the ground. It consists of:

a) An aural warning horn.

**b) A latch located in the landing gear lever**.

c) A bolt.

.

42. Landing gear torque links are used to:

a) maintain the compass heading throughout taxiying and take-off.

b**) prevent rotation of the landing gear piston in the oleo strut.**

c) take up the lateral stresses to which the gear is subjected.

.

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43. One method of minimising the possibility of tyre creep would be:

a) A detachable flange

b) **The wheel incorporating a knurled flange**

c) Fitting fusible plugs

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

a) Ensure the nose-wheel is positioned fore and aft prior to retraction.

b) Lock the landing gear in the up position only.

**c) Lock the landing gear in the down position.**

45. The advantage of a tricycle type landing gear over a tail wheel system is:

a) **There is less danger of the aircraft tipping over in a tail wind**

b) The landing speed is less

c) The braking system is less complicated

46. To prevent scrubbing the tyres while taxiying you should:

a) Use tyres with fusible plugs

b) Make sharp turns only if you have high speed tyres fitted

**c) Deflate the tyres to a minimum pressure**

47. 'Hammering' in a hydraulic system:

a) Is an indication that a further selection is necessary

**b) Is caused by rapid pressure fluctuations and can be detrimental to the system**

c) Is normal and does not affect the system’s efficiency

48. A basic hydraulic system must have as a minimum the following components

a) Reservoir, pump, actuator, filter, accumulator.

b) Pump, actuator, accumulator, filter.

**c) Selector, relief-valve, pump, reservoir, actuator, filter**.

49. A hydraulic lock occurs:

**a) When flow is stopped and the actuator is not able to move**

b) When the thermal relief valve operates

c) When fluid bypasses a system and returns to the tank

50. A main hydraulic system engine driven pump in a modern airliner:

a) **Always needs a positive fluid supply in order to prevent cavitation**

b) Can be run dry without causing any damage

c) Does not need a positive fluid supply if primed before startup

51. A non return valve:

a) Closes if inlet pressure exceeds outlet pressure

b) Can only be fitted if provided with a bypass selector

**c) Closes if inlet pressure ceases**

52. A pre-charge pressure of 100 bar (1500psi) of gas shown on the accumulator

gauge. The hydraulic system is then pressurised to 200 bar (3000psi). The

accumulator gauge will read:

a) 150 bar

b) **200 bar**

c) 300 bar

53. A pressure maintaining or priority valve:

a) Is used to control pressure to services requiring less than system pressure

b) Enables ground operation of services when the engines are off

c**) Is used to ensure available pressure is directed to essential services**

54. A pressure regulator (ACOV) is used in a hydraulic system:

a) To ensure that an equal pressure flow is delivered to critical components such as

servo actuators.

b) As an interface between the system and the cockpit indicators.

**c) In conjunction with a constant delivery type pump.**

55. A restrictor valve is physically fitted in the:

a) U/c down line and flap up line

b) Supply line to the u/c retraction actuator

c) **U/c up line and flap up line**

56. A shuttle valve:

a) Allows one source to operate two units

b) Is used to replace non return valves

**c) Allows one of two supply sources to operate one unit**

57. An ACOV (Automatic Cut Out Valve) in a hydraulic system will:

a) Extend the life of the accumulator

b) Provide an idling circuit for the pump when a selection is made

**c) Provide an idling circuit when the system pressure is reached**

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

a) Their ability to produce high pressure combined with constant high flow rate.

b) Their low cost simplicity and durability.

c) **Their ability to produce high pressure when required but can be off loaded to**

**reduce power consumption**.

59. Case drain filters are:

a) Fitted in the reservoir outlet

b) Designed to allow hydraulic pump lubricating fluid to drain to atmosphere

**c) To enable pump lubricating fluid to be used to monitor pump condition**

60. Different diameter actuators supplied with the same pressure at same rate:

a) Will cause an hydraulic lock

b) Will move at the same speed

**c) Exert different forces**

61. Discounting the possibility of a leak the level in an hydraulic reservoir will:

**a) Fluctuate with jack displacement and accumulator pressure**.

b) Increase as ambient temperature decreases.

c) Always remain the same.

.

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

a) Warn of an impending by-pass situation.

**b) Indicate that the filter is clogged and unfiltered oil is passing around the system.**

c) Warn of an hydraulic system overheat.

63. Hydraulic oil with the designation Def. Stan 91/48 is ................ and ...............

based. Select the correct combination to fill in the missing words

a) Purple / synthetic

b) Red / synthetic

c**) Red / mineral**

64. Hydraulic power is a function of:

a) **System pressure and volume flow**.

b) System pressure and tank capacity.

c) Pump size and volume flow.

65. If an internal leak occurs in a hydraulic system;

a) The fluid temperature will reduce

**b) The fluid temperature will rise**

c) There will be no noticeable effect on the system

66. Insufficient accumulator gas charge pressure will:

a) **All of these answers**

b) Cause rapid pressure fluctuation and chattering

c) Reduce the number of brake applications available following pump failure

67. Large transport aeroplane hydraulic systems usually operate with a system

pressure of approximately:

a) 4000 psi

b) 1000 psi

**c) 3000 psi**

68. Low gas pressure in accumulator causes:

a) Rapid jack movements

b) **Rapid pressure fluctuations while system is operating**

c) No effect on system

69. "Conditioned" air is air that has

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

b) Had any moisture removed from it

c) Had the oxygen content increased

70. A cabin humidifier is used

a) On the ground in high ambient temperatures

**b) At high altitude**

c) On the ground in conditions of low relative humidity

71. A heat exchanger functions by

a) Mixing the various vapors inside the heat exchanger

**b) Passing charge air through ducts and cool ram air around ducts**

c) Removing the static charge

72. A turbo-fan cold air unit will:

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

**air.**

b) Decrease charge air pressure whilst causing the temperature to rise in the heat

exchanger.

c) Not affect the charge air pressure.

73. Air for conditioning and pressurisation is taken from

a) The engine by-pass duct or thrust reverser by-pass duct

b) The engine compressor or ram air turbine

c) **The engine compressor or cabin compressor**

74. Cabin air for modern aircraft is usually taken from:

a) The second fan stage.

b) The low pressure compressor.

c) **The low pressure compressor and from the high pressure compressor if**

**necessary**.

75. How is the (charge) air cooled in a bootstrap Air Cycle Machine

a) By passing it through the fuel heater

b) Via an oil cooled radiator

**c) By expanding over a turbine driving a compressor**

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

a) **The pilot can revert to manual control and select the control valve to the required**

**setting**.

b) The system must be shut down.

c) Manual control can be selected but this is limited to 'hot air' or 'cold air' only.

77. In a "bootstrap" cooling system the charge air is first compressed in the cold air

unit to:

a) Maintain a constant cabin mass air flow.

b) Ensure an adequate charge air flow across the inter-cooler heat exchanger.

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

78. In a bootstrap air cycle machine system cooling air for the heat exchangers is:

a) Engine by pass air

**b) Ram air**

c) Cabin air

79. A pressurisation system works by

a) supplying hot gases from the engine exhaust unit to the mass flow control

system.

b) does not start until an altitude of 8000 feet has been reached.

c) **essentially constant input mass flow and variable output**.

80. An aircraft climbs from sea level to 16,000 ft at 1,000 ft per min the cabin

pressurisation is set to climb at 500 ft per min to a cabin altitude of 8,000 ft.

The time taken for the cabin to reach 8,000 ft is:

a) **The same time it takes the aircraft to reach 16,000 ft**

b) Three times the time it takes the aircraft to reach 16,000 ft

c) Twice the time it takes the aircraft to reach 16,000 ft

81. An aircraft is prevented from being pressurised to any significant differential

pressure above 0.2psi while on the ground by:

a) The auto deflating valve on the main oleos.

**b) The air/ground logic system holding the outflow valve open.**

c) Inhibiting micro switches on the throttles

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82. An aircraft with a pressurized cabin flies at level 310. Following a malfunction of

the pressure controller the outflow valve runs to the open position. Given:

VZc: Cabin rate of climb indication Zc: Cabin pressure altitude DELTA P:

Differential pressure

This will result in a:

**a) VZc increase Zc increase DELTA P decrease**

b) VZc increase Zc increase DELTA P increase

c) VZc decrease Zc increase DELTA P decrease

83. Assume that during cruise flight with air conditioning packs ON the outflow

valve(s) close.

The result would be that the

a) cabin pressure would become equal to the ambient outside air pressure

b) air supply would automatically be stopped

c) **pressure differential would go to the maximum value**

84. Assuming cabin differential pressure has attained the required value in normal

flight conditions if flight altitude is maintained:

a) the pressurisation system must be controlled manually.

b) the pressurisation system ceases to function until leakage reduces the pressure.

c**) a constant mass air flow is permitted through the cabin.**

.

85. Assuming cabin pressure decreases the cabin rate of climb indicator should

indicate:

a) a rate of descent dependent upon the cabin differential pressure.

b) a rate of descent of approximately 300 feet per minute.

**c) a rate of climb.**

86. Cabin altitude in pressurised flight is

a) **Altitude corresponding to cabin pressure regardless of aircraft height**

b) Altitude corresponding to cabin pressure in relation to MSL conditions

c) Altitude at which cabin pressure equals ambient pressure.

87. Cabin altitude means the:

**a) cabin pressure expressed as altitude**.

b) difference in height between the cabin floor and ceiling.

c) flight level altitude at maximum differential pressure.

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88. Cabin differential pressure means the pressure difference between

a) cabin pressure and ambient air pressure at MSL

b) cockpit and passenger cabin

c**) cabin pressure and ambient air pressure**

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89. Cabin pressure is controlled by:

a) **delivering a substantially constant flow of air into the cabin and controlling the**

**outflow**.

b) the cabin air mass flow control inlet valve(s).

c) controlling the flow of air into the cabin with a constant outflow.

90. Cabin pressurisation is controlled by the:

a**) The cabin outflow valve**.

b) The engine's bleed valves.

c) The cabin inlet airflow.

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91. During a normal pressurised climb after take-off the

a) cabin differential pressure is maintained constant

b) absolute cabin pressure increases to compensate for the fall in pressure outside

the aircraft

c) **cabin pressure decreases more slowly than atmospheric pressure**

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

a) the pressurisation system is inoperative until an altitude of 10 000 feet is reached

b) absolute cabin pressure increases to compensate for the fall in pressure outside

the aircraft

**c) cabin pressure decreases more slowly than atmospheric pressure**

93. During level flight at a constant cabin pressure altitude (which could be

decreased even at this flight level) the cabin outflow valves are:

a) Fully closed until the cabin descends to a selected altitude.

b) fully closed until the cabin climbs to a selected altitude.

**c) Partially open.**

94. Fatigue life of the fuselage is based on the

a) Number of landings only

b) Number of explosive decompressions

c**) Number of pressurisation cycles and landings**.

95. For an aircraft in level flight if cabin altitude increases the pressure differential

a) Increases until controlled by the safety valves

b) Increases

**c) Decreases**

96. How does the pressure controller switch from isobaric to max diff control

a) **Automatically when max diff has been reached**

b) Manually when max diff has been reached

c) When selected by the pilot when cruising altitude has been reached

97. If the maximum operating altitude of an aeroplane is limited by the pressurised

cabin then this limitation is due to the maximum:

a) negative differential pressure at maximum cabin altitude

b) negative cabin differential pressure at maximum operating ceiling

**c) positive cabin differential pressure at maximum cabin altitude**

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

pressure the:

a) outflow valve opens completely.

b) negative pressure relief valve will close.

**c) negative pressure relief valve will open**.

99. In the cruise at 30,000 ft the cabin altitude is adjusted from 4,000 ft to 6,000 ft

a) Cabin differential will not be affected

b) The dump valve will close

c**) Cabin differential will decrease**

100. Main and nose wheel bays are

a) Pressurised

b) Different with the mains being unpressurised and the nose pressurised

**c) Unpressurised**