

FINAL EXAMINATION

SUBJECT: AIRCRAFT GENERAL KNOWLEDGE

CLASS: EWAC 01

TIME ALLOWED:2HRS

INSTRUCTIONS:

ANSWER ALL QUESTIONS

PART A(35MKS)

1. Name three main components of hydraulic power operated flight controls (3mks)
2. Describe flight control and control surface movement during a roll to the right (5mks)
3. Highlight types of main planes in the market (3mks)
4. During check A, a pilot detected higher stick forces on the flight controls, list two possible reasons (2mks)
5. State the Pascal's law (2mks)
6. Name and Label the attached figure3.1 (15mks)
7. Define the following terminologies:
 - a.buckling
 - b.strain
8. Brahma's press was discovered in the year-----

PART B(35MK)

1 .Safety valves are biased;

a. Inwards

b.Outwards

c.In the the direction sensed by the SVC

d.Either a or b

2. A fail safe structure:

- A. Has a programmed inspection cycle to detect and rectify faults**
- B. Is changed before its predicted life is reached**
- C. Has redundant strength which will tolerate a certain amount of structural damage**
- D. Is secondary structure of no structural significance**

3. The skin of a modern pressurized aircraft:

- A. Is made up of light alloy steel sheets built on the monocoque principle**
- B. Houses the crew and the payload**
- C. Provides aerodynamic lift and prevent corrosion by keeping out adverse weather**
- D. Is primary load bearing structure carrying much of the structural loads**

4. A lightening hole in a rib:

- A. Prevents lightning strikes damaging the fuselage**
- B. Provides a means of passing cables and controls through a pressure bulkhead**
- C. Collects and disposes of electrical charges**
- D. Lightens and stiffens the structure**

5. Control surface flutter:

- A. Provides additional lift for takeoff and landing in the event of engine failure**
- B. Occurs at high angles of attack**
- C. Is a destructive vibration that must be damped out within the flight envelop**
- D. Is a means of predicting the critical safe lift of the aircraft**

6. Aircraft structure consists mainly of:

- A. Light alloy steel sheets with copper rivets and titanium or steel materials at points requiring high strength**
- B. Magnesium alloy sheets with aluminum rivets and titanium or steel at points requiring high strength**
- C. Aluminum alloy sheets and rivets with titanium or steel materials at points requiring high strength**
- D. Aluminum sheets and rivets with titanium or steel materials at points requiring high strength.**

7. The hydraulic fluid is changes but the wrong fluid is replaced. This would lead to:

- A. High operating fluid temperature
- B. System failure from leaks and blocked filters, high temp and possible corrosion
- C. A rise in the reservoir fill level
- D. Normal operation, it does not matter which fluid is used

8. In an enclosed system pressure is left

- A. More at the piston head than the rest of the cylinder
- B. More at the cylinder end than the piston head
- C. More when the piston is moving than when it is stationary
- D. The same at both ends between the piston and the cylinder head

9. The best extinguishant to use on a wheel or brake fire is:

- A. CO2
- B. Dry powder
- C. Freon
- D. Water

10. The most likely cause of brake fade is;

- A. Oil or grease on the brake drums
- B. Worn stators
- C. The pilot reducing the brake pressure
- D. The brake pads overheating

11. The maximum Zero Fuel Mass (MZFM) of an aircraft is:

- A. The maximum permissible take off mass of the aircraft
- B. The maximum permissible mass of an aircraft with no useable fuel
- C. The maximum permissible mass of an aircraft with zero payload
- D. The maximum permissible landing mass

12. The electrical supply for propeller blades for deicing purposes:

- a. Is controlled to give an intermittent supply

- b. must be taken directly from the APU generator**
- c. must only be selected on for short periods**
- d. is continuous to all blades**

13. Inflight airframe icing does not occur:

- a. Above 25000ft**
- b. above 40000ft**
- c. above 35000ft**
- d. above 30000ft**

14. The methods used to provide de-icing in flight can be:

- a. mechanical or pneumatic fluid**
- b. pneumatic or thermal fluid**
- C. electrically heated or air heated or oil heated**
- d. centrifugally forced or ram air heated**

15. If an aircraft is to be de-iced before departure:

- a. The aircraft can be de-iced with engines are running**
- b. the aircraft can be de-iced with APU running**
- c. the aircraft can be de-iced with APU running and the bleed air off**
- d. whenever the ice detector system warning light comes on**

16. Pilot cockpit windows are heated:

- a. Only to prevent condensation occurring**

- b.by agitating the window molecules with an AC current**
- c.with a reflective inner coating that prevents fogging.**
- d.by passing current across an inner conductive electrical coating**

17. Main and nose wheel bays are:

- a.pressurized**
- b.unpressurized**
- c.conditioned**
- d.different, with the mains being unpressurised and the nose pressurized**

18. The rate of change of cabin pressure should be kept to the minimum.

It is more important:

- a.in climb**
- b.in descent**
- c.in periods when the dehumidifier is in use**
- d.in cruise**

19. Fatigue life of the fuselage is based on the:

- a.the number of pressurized cycles**
- b.number of explosive decompressions**
- c.number of landings only**
- d.number of cycles at maximum differential**

20. In the cruise at 30000ft the cabin altitude is adjusted from 4000ft to 6000ft:

- a. cabin differential will increase**

b.cabin differential will not be affected

c.cabin differential will decrease

d.nil.

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

a.The design ultimate load times a 1.5 safety factor

b.The design limit load plus the design ultimate load

c.Three times the safety factor

d.The design limit load times a 1.5 factor of safety

22. What is the purpose of the wing main spar?

a.To withstand bending and torsional loads

b.To withstand compressive and torsional loads

c.To withstand compressive and shear loads

d.To withstand bending and shear loads

5. The primary purpose of the fuselage is to:

a. Support the wings

b.House the crew and payload

c.Keep out adverse weather

d.Provide access to the cockpit

23. Station numbers (stn) and waterlines (WL) are:

a. Means of locating airframe structure and components

b.Passenger seats location

c.Runway markings for guiding the aircraft to the terminal

d.Compass alignment markings

24. Flight deck windows are constructed from;

a. An amalgam of strengthened glass and vinyl with rubber pressure seals

b.Strengthened glass with shock absorbing clear vinyl interlayer and rubber pressure seals

c.Strengthened clear vinyl with an electrical conducting coat for de-icing and rubber pressure seals

d.Strengthened glass with rubber seals

25. A cantilever wing:

a. Is externally braced with either struts and /or bracing wires

- b. Is supported at one end only with no external bracing**
- c. Has both an upper and a lower airfoil section**
- d. Folds at the roots section to ease storage in confined spaces**

26. A shuttle valve:

- a. Is used to replace NRVS**
- b. Allows two supply sources to operate one unit**
- c. Allows one source to operate two units**
- d. Acts as a non return valve**

27. Def Stan 91/48 is.....and isbased:

- a. Red, mineral**
- b. Red, synthetic**
- c. Green, mineral**
- d. Purple, synthetic**

11. Creep (sleepage):

- a. Is not a problem with tubeless tyres**
- b. Refers to movement of the aircraft against the brakes**

- c. Can rip out the inflation valve on tubed tyres and deflate the tyre
- d. Can be prevented by painting line on the wheel and tyre

28. A likely cause of nose wheel shimmy is;

- a. Aircraft is over weight
- b. The tyre pressures are too high
- c. The aircraft is incorrectly loaded
- d. A torque link is worn or damaged

29. The purpose of secondary stops in a control system is:

- a. To reduce the control loads on the primary stops
- b. To limit control surface range in the event of primary stop failure
- c. To limit the secondary control system from excessive movement
- d. To remove the excess backlash in the controls

30. To yaw an aircraft to the left;

- a. The right rudder pedal is pushed forward and the rudder moves to the left
- b. The right rudder pedal is pushed forward and the rudder moves to the right
- c. The left rudder pedal is pushed forward and the rudder moves to the left
- d. The left rudder pedal is pushed forward and the rudder moves to the left

31. Ice detectors are primarily used to warn the crew:

- a. that they are approaching airframe icing conditions
- b. that they are approaching engine icing conditions

- c.that the engine conditions now warrant the initiation of the engine system
- d.that airframe icing conditions exist

32. Fluid is delivered to a propeller by:

- a.a centrifugal slipper ring and pipes
- b.integral passages within the propeller dome
- c.a small reservoir contained in the spinner
- d.a slinger ring and pipes

33. For maximum strength against impact damage, pilot windows are:

- a.normally kept at minimum size
- b.specially treated during construction
- c.heated internally to I increase elasticity
- d.only heated when IOAT falls below 0 degrees during precipitation

34. In a four stroke engine power is experienced at:

- a.intake stroke
- b.exhaust stroke
- c.compression stroke
- d.power stroke

35. What is the position of piston during the compression stroke of a piston engine?

- a.top dead centre(TDC)

b.bottom dead center(BDC)

c.stationery(ST)

d.some point midway the bore