Headquarters Air Cadets

Examination

Staff Cadet

Air Frames

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1. Use black or dark blue pen, NOT pencil.
2. Write only on the answer sheet. Add your personal details.

1 In a transport aircraft, to what approximate altitude is the fuselage pressurised:

a 4200m (13,500ft)
b 24m (80ft)
c 240m (800ft)
d 2400m (8000ft)

2 Which major airframe unit contains an aircraft's fixed vertical fin:

a The horizontal stabilizer
b The canards
c The tail unit
d The fuselage

3 When designing an aircraft an increase in weight in one area which leads to other areas being strengthened, and therefore made more heavy, is called the:

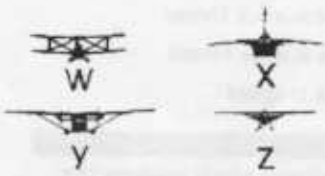
a Weight spiral deflect
b Weight increase system
c Weight spinning effect
d Weight spiral effect

4 Loads on an airframe increase as the square of the airspeed. Increasing speed from 100 kts to 500 kts increases the air loads by te following amount:

a Fifty times
b Five hundred times
c Twenty five times
d Five times

5 Which of these aircraft has a wing construction known as cantilever:

a X
b W
c Y
d Z



6 The main construction components of an airframe are ties, struts, beams and webs. A web is a member which is subject purely to:

a Loads in shear
b Compression
c Loads at an angle
d Tension (pulling)

7 A structure which is strong enough to take the loads applied it both in compression and tension, despite being supported at one end only, its called:

a Uniliever structure
b Cantilever structure
c Monolever structure
d Ortholever structure

8 If the wing of a high-speed aircraft deflects too much, damage and loss of control can be caused by an aerodynamic phenomenon known as:

a TUTTER
b MUTTER
c FLATTER
d FLUTTER

9 The most important characteristic of materials used in airframe construction is that they have:

a A low RSW
b A low SWR
c A high SWR
d A high WSR

10 Pure aluminium is often plated onto its alloys to form a protective layer because aluminium:

a Is very resistant to corrosion
b Has a very high SWR
c Is prone to attack by sea-water
d Can be super-plastically formed

11 At a precise temperature two pieces of titanium pressed together will fuse and become a single piece. This process is called:

a Diffusion bending
b Diffusion bonding
c Fusion bonding
d Rediflusion blonding

12 Fibres of materials such as glass, carbon or kevlar inside a thermosetting resin such as epoxy are known as:

a COMPOSTS
b CAMPSITES
c COMPOSITES
d COMPOSITIONS

13 What is the fatigue life, in flying hours, of the BULLDOG aircraft:

a 5000
b 45 000
c 4500
d 50 000

14 One of the two main components of an aircraft wing is its skin, the other is its:

a Fabric
b Internal structure
c Ribs
d External structure

15 A BILLET is the name given to a single piece of metal used during the machined skin construction of an aircraft's:

a WINDSCREEN
b WING
c REST AREA
d UNDERCARRIAGE

16 Foreplanes, or canards, are almost always all-flying, this means that:

a The entire surface moves to provide control movements
b They are placed over the main wing sections
c They are the only surfaces to produce control movements
d They are always producing lift

17 What is the ideal shape for a cut out in a fuselage:

a An ellipse
b A rectangle with rounded corners
c A circle
d A rectangle

18 If the engines of a four-engined aircraft are placed far out on the wings and an engine fails, what is the effect of the thrust from the remaining engines:

a PITCH
b ROLL
c CLIMB
d YAW

19 To ensure that the aircraft tail does not hit the ground on take-off or landing, the main wheels must be:

a In front of the centre of gravity
b Behind the centre of gravity
c Underneath the tail
d At the centre of gravity

20 What piece of equipment ensures that an undercarriage cannot be retracted accidentally on the ground:

a Down lock
b Chock
c Ground lock
d A sequencer valve

21 If a control back-up system is manually operated, failure of the primary hydraulic system will cause an immediate:

a Increase in altitude
b Decrease in stick forces
c Increase in stick forces
d Decrease in speed

22 Control surfaces which combine the functions of elevators and ailerons are called:

a ELEVONS
b ELEFLAPS
c AILERONS
d RUDDERATORS

23 In order to reduce the risk of fire from hydraulic fluids they are usually:

a INEBRIATED
b INHABITED
c INUNDATED
d INHIBITED

24 A constant speed drive unit is used to ensure that generators run at a constant speed, regardless of:

a Engine speed
b Aircraft Speed
c Power demands
d Airspeed

25 What instrument is represented in this diagram

a VSI
b Attitude Director
c ASI
d Radar Altimeter