Headquarters Air Cadets
Examination

Staff Cadet
33/4 Airframes
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1. Use black or dark blue pen, NOT pencil.
2. Mark one answer per question with a cross.
3. If you wish to change an answer, cancel the original mark and mark another single answer.

X A selected answer.
X A cancelled answer.

Mark:

Name and Initals _____ Date of Exam _____

Date of Birth _____ Squadron/Unit _____ Wing _____

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

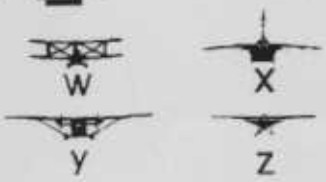
a ☐ 2400m (8000ft)
b ☐ 240m (800ft)
c ☐ 24m (80ft)
d ☐ 4200m (13,500ft)

2 The undercarriage serves two main purposes, one is to absorb landing shocks, the other is:

a ☐ To support the aircraft on the ground
b ☐ To exercise hydraulic systems
c ☐ To provide more lift on final approach
d ☐ To provide aerodynamic braking

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

a ☐ W
b ☐ X
c ☐ Y
d ☐ Z



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

5 When considering an aircraft's wing, the square of its span , divided by its area is known as its:

a ☐ WING LOADING
b ☐ MEAN CHORD VALVE
c ☐ ASPECT RATIO
d ☐ ASPIC RATIO

6 If a metal chosen for airframe construction has the same properties throughout it is said to be:

a ☐ HOMOGENOUS
b ☐ HOMOGENIOUS
c ☐ AN ALLOY
d ☐ AL-CLAD

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

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

8 Steels can be produced with a wide range of properties, ranging from very hard to very ductile. However, they are all very:

a ☐ Brittle
b ☐ Expensive
c ☐ Heavy
d ☐ Corrosive

9 Titanium has only recently become widely available in airframe construction, so it is quite:

a ☐ Heavy
b ☐ Rare
c ☐ Expensive
d ☐ Malleable

10 Aircraft wing ribs often have large lightening holes in them. What is a possible use for these holes:

a ☐ To prevent condensation
b ☐ To allow fuel to flow along the wing
c ☐ To allow the wing to flex more
d ☐ To prevent corrosion

11 Most modern aircraft have 2 main spars in their wing construction, with stressed skin between them. This type of construction is known as:

a ☐ TENSION BOX
b ☐ TORSION BOX
c ☐ TORQUE BLOCKS
d ☐ TENSION BLOCKS

12 Why are aircraft engines placed as close as possible to the aircraft's centreline:

a ☐ To prevent pitch when an engine fails
b ☐ To prevent yaw when an engine fails
c ☐ To prevent roll when an engine fails
d ☐ To reduce fuel weight in the outboard wing sections

13 Where are the engines mounted on a Jetstream aircraft:

a ☐ In the fuselage
b ☐ On the wings
c ☐ At the rear of the fuselage
d ☐ In pods under the wings

14 Which part of an undercarriage system normally has to be disconnected before towing:

a ☐ The nose-wheel steering
b ☐ The oleo nitrogen resevoir
c ☐ The uni-directional torsion link
d ☐ The nose-wheel brakes

15 Where are an aircraft's main wheels often stowed during flight:

a ☐ In the oleos
b ☐ In the tail
c ☐ In the ailerons
d ☐ In the wings

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

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

17 Which plane of movement is controlled by ailerons:

a ☐ YAW
b ☐ CLIMB
c ☐ PITCH
d ☐ ROLL

18 The big advantage of fly-by-wire systems is that they eliminate the need for:

a ☐ Cables and linkages
b ☐ Control surfaces
c ☐ Wire connections
d ☐ Computers

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

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

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

a ☐ RUDDERATORS
b ☐ AILERONS
c ☐ ELEFLAPS
d ☐ ELEVONS

21 Routine flying for long periods on one heading can easily be performed by a mechanical or electronic system called:

a ☐ An autodirector
b ☐ An autonav
c ☐ An autoguide
d ☐ An autopilot

22 For an autopilot to control an aircraft in pitch, roll and yaw axes it requires how many CHANNELS:

a ☐ 1
b ☐ 2
c ☐ 3
d ☐ 4

23 In an auto-pilot the speed at which disturbance correcting servo-motors travel is:

a ☐ The same as the size of the signal they receive
b ☐ Inversely proportional to the size of the signal they receive
c ☐ Proportional to the size of the signal they receive
d ☐ Less than the size of the signal they receive

24 A major disadvantage of pneumatic systems over hydraulic systems is that air is

a ☐ COMPRESSIBLE
b ☐ INVISIBLE
c ☐ REVERSIBLE
d ☐ CONDENSABLE

25 To avoid boiling at high altitude fuel in aircraft tanks is:

a ☐ CIRCULATED
b ☐ PRESSURISED
c ☐ COOLED
d ☐ VENTED