



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.

A selected answer.

A cancelled answer.

Mark:

Name and Initials _____

Date of Exam _____

Date of Birth _____

Squadron/Unit _____

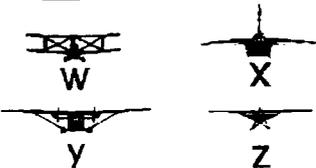
Wing _____

1 What is the main purpose of an aircraft's wings:

- a To support engines
- b To overcome drag
- c To carry fuel
- d To generate lift

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

- a X
- b Y
- c Z
- d W



3 The aerodynamic phenomenon known as FLUTTER is caused when the wings of a high-speed aircraft:

- a Deflect too much
- b Are too swept-back
- c Twist too much
- d Are too rigid

4 Which of these is the aspect ratio of a wing:

- a Span(squared) divided by area
- b Span divided by area
- c Area divided by span
- d Area(squared) divided by span

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

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

6 The most widely-used group of airframe construction materials is:

- a Plastics and composites
- b Aluminium and magnesium alloys
- c Titanium and its alloys
- d Pure aluminium and magnesium

7 When iron is alloyed with one of a range of other metals, the result is:

- a TITANIUM
- b STEEL
- c MAGNESIUM
- d ALUMINIUM

8 Diffusion bonding is the process where two pieces of metal, at a precise temperature, will fuse and become a single piece when pressed together. This process is possible with:

- a ALUMINIUM
- b STEEL
- c TITANIUM
- d PLASTIC

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

- a COMPOSITES
- b CAMPSITES
- c COMPOSTS
- d COMPOSITIONS

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

- a 45 000
- b 50 000
- c 4500
- d 5000

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

- a Fabric
- b Internal structure
- c External structure
- d Ribs

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

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

13 One particular type of construction is particularly useful in fuselages as it leaves a large proportion of the inside free for crew, passengers and cargo. That construction is called:

- a SEMI RIGID
- b SEMI MONOCOQUE
- c SPHERICAL RIGID
- d SPHERICAL MONOCOQUE

14 Where are the engines mounted on the Boeing E-3D Sentry aircraft

- a On the wings
- b At the rear
- c In under-wing pods
- d On the fuselage

- 15 Nose-wheel or tricycle undercarriages have two main disadvantages, they are stronger and therefore heavier than tail-wheels and:
- a The C of G is forward of the main wheels
 - b There is more tendency to float on landing
 - c The pilot's view is impaired
 - d Damage is greater if a nose-wheel collapses

- 16 An OLEO PNEUMATIC undercarriage system compresses:
- a Oil
 - b Water
 - c Liquid oxygen
 - d Air or nitrogen gas

- 17 Where are an aircraft's main wheels often stowed during flight:
- a In the wings
 - b In the oleos
 - c In the ailerons
 - d In the tail

- 18 The two main types of aircraft brakes are:
- a Drum and disc
 - b Cable and disc
 - c Drum and cable
 - d Air and nitrogen

- 19 Which plane of movement is controlled by elevators or foreplanes
- a DIVE
 - b PITCH
 - c ROLL
 - d YAW

- 20 The control column, or "stick", operates:
- a RUDDER AND ELEVATORS
 - b RUDDER AND AILERONS
 - c ELEVATORS AND RUDDER
 - d ELEVATORS AND AILERONS

- 21 The big advantage of fly-by-wire systems is that they eliminate the need for:
- a Computers
 - b Control surfaces
 - c Wire connections
 - d Cables and linkages

- 22 For an autopilot to control an aircraft in pitch, roll and yaw axes it requires how many CHANNELS:
- a 4
 - b 2
 - c 3
 - d 1

- 23 Radar which maps the ground in front of the aircraft is called:
- a Terrain-following radar
 - b Terrain-guidance radar
 - c Ground-following radar
 - d Ground-proximity radar

- 24 De-icing of leading edges, tailplanes and engine intakes is often performed by using:
- a Pneumatic bleed air
 - b Compressor pump air
 - c Compressor bleed air
 - d Conditioning air

- 25 What instrument is represented in this diagram
- a Radar Altimeter
 - b Attitude Director
 - c ASI
 - d VSI

