



# 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 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 increase system  
b  Weight spinning effect  
c  Weight spiral deflect  
d  Weight spiral effect
- 
- 2 The main construction components of an airframe are ties, struts, beams and webs. A web is a member which is subject purely to:
- a  Compression  
b  Loads in shear  
c  Tension (pulling)  
d  Loads at an angle
- 
- 3 If an aircraft was built with the skin strong enough to carry all loads without any supporting framework it's construction would be known as:
- a  SEMI-MONOCOQUE  
b  FRAMED  
c  MONOCOQUE  
d  STRESSED SKIN
- 
- 4 An aircraft's wing loading is found by:
- a  Dividing its weight by the wing area  
b  Multiplying its wing area by its weight  
c  Dividing its wing area by its weight  
d  Multiplying its wing area by its aspect ratio

- 5 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  Cantilever structure  
b  Ortholever structure  
c  Unilever structure  
d  Monolever structure
- 
- 6 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  Are too rigid  
d  Twist too much
- 
- 7 At speeds near to the speed of sound the pressure waves generated in front of an aircraft cannot move forwards fast enough to warn the oncoming air an aircraft is approaching and they become:
- a  SHOCK WAVES  
b  SHOCK PRESSURES  
c  SHOCK WEAVES  
d  PRESSURE WAVES
- 
- 8 When considering an aircraft's wing, the square of its span, divided by its area is known as its:
- a  MEAN CHORD VALVE  
b  WING LOADING  
c  ASPIC RATIO  
d  ASPECT RATIO

- 9 If a metal chosen for airframe construction has the same properties throughout it is said to be:
- a  AN ALLOY  
b  AL-CLAD  
c  HOMOGENOUS  
d  HOMOGENIOUS

- 10 What is the fatigue life, in flying hours, of the BULLDOG aircraft:
- a  4500  
b  45 000  
c  5000  
d  50 000
- 
- 11 A BILLET is the name given to a single piece of metal used during the machined skin construction of an aircraft's:
- a  UNDERCARRIAGE  
b  WINDSCREEN  
c  REST AREA  
d  WING
- 
- 12 In a high-flying, pressurised aircraft, the pressure difference between the inside and outside of the aircraft would be:
- a  5.6kg per square metre  
b  5600kg per square metre  
c  56000kg per square metre  
d  56kg per square metre
- 
- 13 The ideal shape of a window in an aircraft fuselage is:
- a  Square  
b  Round  
c  Rectangular with rounded corners  
d  Elliptical
- 
- 14 Why are aircraft engines placed as close as possible to the aircraft's centreline:
- a  To prevent yaw when an engine fails  
b  To prevent roll when an engine fails  
c  To reduce fuel weight in the outboard wing sections  
d  To prevent pitch when an engine fails

15 Where are the engines mounted on a Dominie aircraft

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

16 An undercarriage should be as light as possible because:

- a  It is difficult to retract
- b  It is dead weight when airborne
- c  Heavy undercarriages damage runways
- d  It places high loads on the wing mountings

17 What is an OLEO LEG:

- a  A spring steel shock absorber
- b  A gas-filled telescope
- c  A telescopic shock absorber
- d  A Spanish undercarriage

18 Roll is controlled by:

- a  ELEVATORS OR CANARDS
- b  AILERONS
- c  RUDDER
- d  AIRBRAKES

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

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

20 An autopilot performs two fundamental operations. It detects when an aircraft has strayed from the required flight path and:

- a  It sends error messages to the pilot's headset
- b  It calculates and performs correcting control movements
- c  Re-calculates the ETA at the destination
- d  It measures the errors involved

21 Autopilot disturbance correctors are called:

- a  Servo-motors
- b  Service-motors
- c  Serving-motors
- d  Salvo-motors

22 What is the meaning of ILS:

- a  Instrument Landing System
- b  Interim Landing System
- c  Interim Lighting System
- d  Immediate Landing System

23 Radar which maps the ground in front of the aircraft is called:

- a  Ground-proximity radar
- b  Ground-following radar
- c  Terrain-following radar
- d  Terrain-guidance radar

24 Pneumatic systems work in a similar way to hydraulic systems, except that pneumatic systems use high-pressure:

- a  FUEL
- b  GAS
- c  AIR
- d  WATER

25 The device which takes energy from the outside airstream to turn a generator in an emergency is called:

- a  An auxilliary power unit
- b  A tram-air turbine
- c  A ram-air battery
- d  A ram-air turbine