



# Headquarters Air Cadets Examination

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4  
Staff Cadet

Air Frames  
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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 The undercarriage serves two main purposes, one is to support the aircraft on the ground, the other is:
- To provide aerodynamic braking
  - To exercise hydraulic systems
  - To absorb landing shocks
  - To improve lift on final approach
- 
- 2 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:
- Weight spiral deflect
  - Weight increase system
  - Weight spiral effect
  - Weight spinning effect
- 
- 3 The main construction components of an airframe are ties, struts, beams and webs. A strut is a member which is subject purely to:
- Tension (pulling)
  - Compression
  - Loads at an angle
  - Loads in shear
- 
- 4 If an aircraft's fuselage is made up of a series of frames, or hoops, what is the name given to the metal strips which run the length of the fuselage, joining the frames:
- STINGERS
  - SKINNERS
  - STRINGERS
  - STRIPPERS
- 
- 5 The aerodynamic phenomenon known as FLUTTER is caused when the wings of a high-speed aircraft:
- Twist too much
  - Deflect too much
  - Are too swept-back
  - Are too rigid
- 
- 6 A SHOCK WAVE is generated in front of an aircraft as its speed approaches:
- The speed of the surrounding air
  - The speed of sound
  - Stalling speed
  - The speed of light
- 
- 7 Which of these is the aspect ratio of a wing:
- Area divided by span
  - Span divided by area
  - Span(squared) divided by area
  - Area(squared) divided by span
- 
- 8 One important characteristic of an alloy used in airframe construction is that it should be HOMOGENOUS, which means:
- Having different properties throughout
  - Having the same properties throughout
  - Having a high SWR
  - Being man-made
- 
- 9 Why are magnesium alloys rarely used in carrier-based aircraft construction:
- They do not float in sea-water
  - It is difficult to AL-CLAD them
  - They have a low SWR
  - They are prone to attack by sea-water
- 
- 10 Fibres of materials such as glass, carbon or kevlar inside a thermosetting resin such as epoxy are known as:
- COMPOSITIONS
  - COMPOSTS
  - COMPOSITES
  - CAMPSITES
- 
- 11 A material's tendency to break under a high number of relative stresses, such as take-offs and landings, is called:
- FATIGUE
  - FLEXING
  - FRACTURE
  - BENDING
- 
- 12 Which of these is the best material for a radome:
- Fibre-glass
  - High tensile steel
  - Carbon steel
  - Magnesium alloy
- 
- 13 One of the two main components of an aircraft wing is the internal structure, the other is:
- The ribs
  - The spars
  - The aileron
  - The skin
- 
- 14 What type of wing skin construction is normally used for aircraft of medium-to-high speed:
- Stretched skin
  - Fabric skin
  - Composite skin
  - Stressed skin
- 
- 15 A multi-spar wing layout is particularly useful in constructing wings for what type of aircraft:
- LOW LEVEL
  - LOW SPEED
  - TRAINERS
  - HIGH SPEED

16 In a high-flying, pressurised aircraft, the pressure difference between the inside and outside of the aircraft would be:

- a  5600kg per square metre
- b  56000kg per square metre
- c  56kg per square metre
- d  5.6kg per square metre

17 If a single jet engine is fitted to an aircraft it will normally be fitted:

- a  In the fuselage, near the centre of gravity
- b  In the nose
- c  At the rear of the fuselage
- d  In the tail

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

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

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

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

20 Differential braking allows the pilot to use the brakes to:

- a  Accelerate
- b  Steer
- c  Use different brakes
- d  Stop

21 Yaw is controlled by:

- a  Ailerons
- b  Elevators or foreplanes
- c  Airbrakes
- d  Rudder

22 The control column or stick operates elevators and

- a  AILERONS
- b  RUDDER
- c  UNDERCARRIAGE
- d  FIN

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

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

24 At high altitudes fuel in aircraft tanks is pressurised to prevent:

- a  BOILING
- b  FREEZING
- c  VENTING
- d  EVAPORATION

25 What instrument is represented in this diagram

- a  Radar Altimeter
- b  VSI
- c  Attitude Director
- d  ASI

