



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 generate lift
- c To carry fuel
- d To overcome drag

2 The main structural link between an aircraft's wings and tail unit is called:

- a The undercarriage
- b The fuselage
- c The control link
- d The ailerons

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

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

4 When an aircraft's speed increases, so does its drag. Drag increases as:

- a The square of the speed
- b The square root of the speed
- c The cube of the speed
- d The speed's cube root

5 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 STRESSED SKIN
- b MONOCOQUE
- c SEMI-MONOCOQUE
- d FRAMED

6 If we take the weight of an aircraft and divide it by the wing area, the result is known as its:

- a EFFECTIVE WEIGHT
- b ASPECT RATIO
- c WING LOADING
- d WING STRESS

7 A Braced Monoplane has:

- a Bracing ties between wing and fuselage
- b Stressed struts between wing and fuselage
- c Bracing webs between wing and fuselage
- d Bracing ties between both wings

8 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

9 Why are magnesium alloys rarely used in carrier-based aircraft construction:

- a It is difficult to AL-CLAD them
- b They do not float in sea-water
- c They are prone to attack by sea-water
- d They have a low SWR

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

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

11 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 TITANIUM
- b PLASTIC
- c STEEL
- d ALUMINIUM

12 A material's tendency to break under a high number of relative stresses, such as take-offs and landings, is called:

- a FATIGUE
- b FRACTURE
- c FLEXING
- d BENDING

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

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

14 If only one piston engine/propellor combination or turbo prop engine is fitted to an aircraft it will normally be fitted:

- a In the nose
- b On the starboard wing
- c In the tail
- d In the fuselage, rear the centre of gravity

- 15 Why are aircraft engines placed as close as possible to the aircraft's centreline:
- a To prevent yaw when an engine fails
 - b To reduce fuel weight in the outboard wing sections
 - c To prevent roll when an engine fails
 - d To prevent pitch when an engine fails

- 16 Where are the engines mounted on the Boeing E-3D Sentry aircraft
- a At the rear
 - b In under-wing pods
 - c On the wings
 - d On the fuselage

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

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

- 19 Differential braking allows the pilot to use the brakes to:
- a Stop
 - b Accelerate
 - c Use different brakes
 - d Steer

- 20 Which control surfaces are hinged to the fin spar:
- a AILERONS
 - b FIN
 - c RUDDER
 - d ELEVATORS

- 21 There are three main methods of operating control surfaces - they are manual, power assisted and:
- a Manually powered
 - b Manually assisted
 - c Power operated
 - d Power dependant

- 22 Routine flying for long periods on one heading can easily be performed by a mechanical or electronic system called:
- a An autoguide
 - b An autodirector
 - c An autonav
 - d An autopilot

- 23 What is the meaning of ILS:
- a Interim Landing System
 - b Instrument Landing System
 - c Interim Lighting System
 - d Immediate Landing System

- 24 At high altitudes fuel in aircraft tanks is pressurised to prevent:
- a VENTING
 - b EVAPORATION
 - c FREEZING
 - d BOILING

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

