



# Headquarters Air Cadets Examination

Leading Cadet  
33/2 Principles of Flight  
Generated 15-Jul-02

Serial: 498

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 \_\_\_\_\_

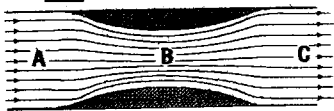
Wing \_\_\_\_\_

1 To fly, an aircraft must generate lift to oppose its:

- a  Drag
- b  Thrust
- c  Weight
- d  Inertia

2 In the diagram, air is flowing past a constriction. What has happened to the air pressure at point B?

- a  It is the same as at point C
- b  It is greater than at point C
- c  It is greater than at point A
- d  It is lower than at point A



3 On a general purpose aerofoil, the greatest amount of lift occurs:

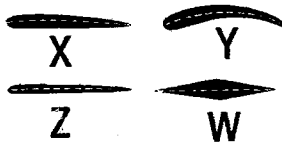
- a  At the centre of the bottom surface
- b  Where the top surface is not curved
- c  Just forward of the trailing edge
- d  Where the top surface is curved the most

4 The centre of pressure on an aerofoil is?

- a  The point at which all the lift is said to act
- b  Two thirds of the way along the chord line, measured from the leading edge
- c  The point at which all the weight is said to act
- d  Half way along the chord line

5 Which of these wing sections are for high lift?

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



6 At the stall of a particular wing which one of these factors is NOT variable?

- a  The amount of weight supported by the wing
- b  The angle of attack at which it stalls
- c  The air speed at which it stalls
- d  The amount of lift being produced by the wing at the stall

7 The angle of attack at which a wing stalls is known as?

- a  Crucial angle
- b  Stopped angle
- c  Stilled angle
- d  Critical angle

8 To slow an aircraft from straight and level flight which of the following statements is true?

- a  Thrust must equal drag
- b  Drag must exceed thrust
- c  Thrust must exceed drag
- d  Drag must be half thrust

9 Which axis runs from nose to tail in an aircraft?

- a  Bilateral
- b  Lateral
- c  Longitudinal
- d  Normal

10 A well designed aircraft that is disturbed from level flight (say, by bumpy air) will tend to go back to level flight of its own accord, without the pilot having to make adjustments. This property is called?

- a  Instability
- b  Damping
- c  Inertia
- d  Stability

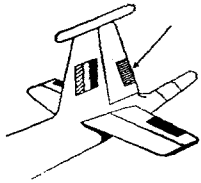
11 This aircraft is flying towards you. What angle is the arrow pointing to?

- a  Lift angle
- b  Cohedral angle
- c  Anhedral angle
- d  Dihedral angle



12 On this diagram, what does the arrow point to ?

- a  Rudder trimming tab
- b  Fin
- c  Elevator
- d  Elevator trimming tab



13 Which of the following will occur when flap is lowered during the approach to land?

- a  A higher touch-down speed will be needed
- b  Lift will increase
- c  Stalling speed will be increased
- d  Drag will be reduced

14 When slats are open on a wing what effect will this have on the stalling angle and stalling speed?

- a  Increase      Reduce
- b  Reduce      Reduce
- c  Reduce      Increase
- d  Increase      Increase

15 A glider with a gliding angle of 1 in 30 is in still air and flying over level ground. What distance will the aircraft travel from a height of 1640 feet (0.5 kilometre) before reaching the ground.

- a  30 kms
- b  25 kms
- c  15 kms
- d  60 kms

16 A helicopter generates lift by:

- a  Spinning aerofoil shaped blades
- b  Spinning an aerofoil shaped tail rotor
- c  Use of the engine exhaust
- d  Using the torque reaction

17 Tilting the rotor disc of a helicopter forward will make the helicopter:

- a  Hover
- b  Climb
- c  Travel forwards
- d  Travel backwards

18 When the pilot of a helicopter makes a large upwards movement of the collective lever more power is required. How is this extra power obtained?

- a  An automatic cam arrangement opens the engine throttle and no further action is required
- b  The pilot turns the hand throttle to open it
- c  The yaw pedals are operated to increase the load on the engine
- d  The cyclic pitch is altered taking the load off the tail rotor

19 The pitch angle of a helicopters rotor blades can be altered individually, as each one traverses the plane of rotation. This is called?

- a  Torque reaction
- b  Pitching
- c  Collective pitch
- d  Cyclic pitch

20 Lift is obtained from almost all parts of the wing but not equally from every part. About how much is obtained from the top surface of an aircraft wing such as a Chipmunk:

- a  Up to 50%
- b  Up to 25%
- c  Up to 80%
- d  Up to 33%

21 On an aircraft, if the airspeed over a wing is trebled, and all other factors affecting lift are unchanged, the lift is:

- a  Multiplied by about 9
- b  Unchanged
- c  Divided by about 3
- d  Multiplied by about 3

22 The movement of an aircraft about its normal axis is called:

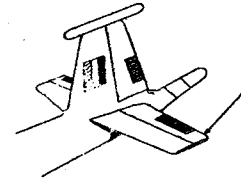
- a  Rolling
- b  Yawing
- c  Pitching
- d  Damping

23 The action of airbrakes on the wings of a glider is to:

- a  Reduce lift and increase drag
- b  Increase lift and reduce drag
- c  Reduce lift and reduce drag
- d  Increase lift and increase drag

24 On this diagram, what does the arrow point to ?

- a  Elevator
- b  Fuselage
- c  Fin
- d  Rudder



25 In this diagram what is the arrow pointing to?

- a  A rudder trimming tab
- b  A fin
- c  An elevator trimming tab
- d  A fuselage

