



# Headquarters Air Cadets Examination

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Leading Cadet  
33/2 Principles of Flight  
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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 Which scientist formulated laws, one of which says that every action has an equal and opposite reaction?

- a ☐ Riddely
- b ☐ Morgan
- c ☐ Einstein
- d ☐ Newton

2 As air passes over the top surface of a wing in normal flight, its speed will:

- a ☐ Increase
- b ☐ Remain constant
- c ☐ Reduce considerably
- d ☐ Reduce slightly

3 In what direction does lift operate relative to airflow?

- a ☐ Straight up
- b ☐ At 90degrees to it
- c ☐ Parallel to it
- d ☐ Straight down

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 ☐ Half way along the chord line
- d ☐ The point at which all the weight is said to act

5 Which of these wing sections is for general purpose?

- a ☐ Z
- b ☐ W
- c ☐ X
- d ☐ Y



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 resistance to the forward movement of an aircraft is called?

- a ☐ Turbulence
- b ☐ Drag
- c ☐ Resistance
- d ☐ Thrust

8 The 3 axes about which an aircraft moves are?

- a ☐ Lateral, bilateral and normal
- b ☐ Longitudinal, lateral and diagonal
- c ☐ Lateral, normal and diagonal
- d ☐ Longitudinal, lateral and normal

9 The movement of an aircraft about its longitudinal axis is called?

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

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

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



11 Aircraft movements such as pitching, rolling and yawing are always described in relation to the?

- a ☐ Ground
- b ☐ Pilot
- c ☐ Airflow
- d ☐ Horizon

12 Which of these is used by the pilot to make the aircraft yaw?

- a ☐ Rudder
- b ☐ Elevator
- c ☐ Fin
- d ☐ Aileron

13 A glider with a gliding angle of 1 in 20 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 ☐ 8.75 kms
- b ☐ 20 kms
- c ☐ 5 kms
- d ☐ 10 kms

14 A helicopter generates lift by using

- a ☐ The engine exhaust
- b ☐ The tail rotor
- c ☐ Spinning blades
- d ☐ The torque reaction

15 The lift of a helicopter blade can be increased by?

- a ☐ Slowing the rotor head down
- b ☐ Pointing the nose into wind
- c ☐ Decreasing the pitch angle
- d ☐ Increasing the pitch angle

16 The pitch angle of all the main rotor blades of a helicopter can be altered by the same amount at the same time. This is called:

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

17 What is the main function of a helicopter's cyclic control?

- a ☐ Controls horizontal flight in any direction
- b ☐ Controls the engine speed
- c ☐ Controls the helicopter's vertical movement
- d ☐ Acts as a rudder

18 Which part of an aircraft produces drag which resists forward motion?

- a ☐ Only those parts which are producing lift
- b ☐ The fuselage but not the wings
- c ☐ Every part of the aircraft over which air flows
- d ☐ Only those parts of the aircraft that are not producing lift

19 Which of these is used by the pilot to make the aircraft pitch?

- a ☐ Fin
- b ☐ Aileron
- c ☐ Elevator
- d ☐ Rudder

20 The point on a wing at which all the lift is said to act is called:

- a ☐ Static point
- b ☐ Centre of pressure
- c ☐ Dynamic centre
- d ☐ Pressure point





21 In order to control an aircraft in the rolling plane, a pilot of an aircraft fitted with conventional controls uses:

- a ☐ The ailerons
- b ☐ The rudder
- c ☐ The flaps
- d ☐ The elevators

22 A designer needs one shape of wing for the highest possible flying speed but another for the slowest possible landing speed. What does he provide to enable one wing to achieve both?

- a ☐ Elevators
- b ☐ Trimming tabs
- c ☐ Balance tabs
- d ☐ Flaps

23 Which of the following is a split flap?

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

24 In what direction relative to the direction of the oncoming air, or path of the aircraft, do the lift forces act?

- a ☐ At 90 degrees
- b ☐ The same direction
- c ☐ At about 4 degrees
- d ☐ The opposite direction

25 At position 1, the aircraft is climbing vertically. To make the aircraft move to position 2 and then to position 3, the pilot must move the control column:

- a ☐ To the right
- b ☐ Forward
- c ☐ To the left
- d ☐ Back

