



Headquarters Air Cadets Examination

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Leading Cadet
Principles of Flight
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Serial: 75

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 _____

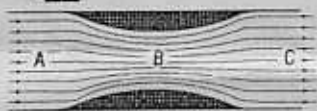
Wing _____

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

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



3 In what direction does lift operate relative to airflow?

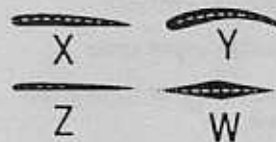
- a ☐ Straight down
- b ☐ Perpendicular (at 90°) to it
- c ☐ Parallel to it
- d ☐ Straight up

4 The centre of pressure on an aerofoil is?

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



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 amount of lift being produced by the wing at the stall
- d ☐ The air speed at which it stalls

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

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

8 If you doubled the airspeed the drag would increase by a factor of?

- a ☐ 4
- b ☐ 6
- c ☐ 2
- d ☐ 8

9 Which axis of rotation on an aircraft generally runs from wing tip to wing tip?

- a ☐ Lateral
- b ☐ Longitudinal
- c ☐ Diagonal
- d ☐ Normal

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

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



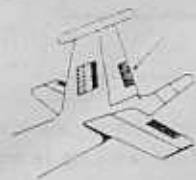
11 On this diagram what does the arrow point to?

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



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

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



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

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

14 To obtain the maximum drag from an aircraft's flaps, they should be set to?

- a ☐ 40°
- b ☐ 10°
- c ☐ 90°
- d ☐ 30°

15 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 ☐ 5 kms
- b ☐ 20 kms
- c ☐ 8.75 kms
- d ☐ 10 kms

16 A Viking glider with a gliding angle of 1 in 35 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 ☐ 70 kms
- b ☐ 8.75 kms
- c ☐ 35 kms
- d ☐ 17.5 kms

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

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

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

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

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

20 Which of these describes the effect of slats at low speeds?

- a ☐ Help the pilot to move the control surfaces into the airflow
- b ☐ Smooth out turbulence in the airflow over the wing
- c ☐ Generate extra turbulence in the airflow over the wing
- d ☐ Make it more difficult for the pilot to move the control surfaces into the airflow

21 On a general purpose wing, at which angle of attack is the greatest lift produced?

- a ☐ About 5°
- b ☐ About 20°
- c ☐ About 10°
- d ☐ About 15°

22 If an aircraft in steady straight and level flight suffered a sudden reduction in weight (for example, by jettisoning fuel), and the pilot made no changes to the controls, the aircraft would begin to:

- a ☐ Descend
- b ☐ Slow down
- c ☐ Climb
- d ☐ Speed up

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

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

24 In steady straight and level flight at constant height and speed, the amount of lift produced by the aircraft must be:

- a ☐ Equal to the aircraft's thrust
- b ☐ Greater than the aircraft's drag
- c ☐ Equal to the aircraft's weight
- d ☐ Greater than the aircraft's weight

25 When a glider pilot operates the airbrakes what is the effect?

- a ☐ Lift is reduced and drag is increased
- b ☐ Lift is increased and drag is reduced
- c ☐ Lift is increased and drag is increased
- d ☐ Lift is reduced and drag is reduced