



Headquarters Air Cadets Examination

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Leading Cadet
Principles of Flight

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1. Use black or dark blue pen, NOT pencil.
2. Write only on the answer sheet. Add your personal details.

GROUP 5

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

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

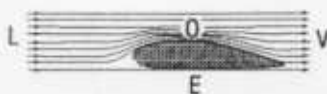
2 In the diagram, air is flowing past a constriction. What has happened to the air pressure at point B?

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



3 Where is the air pressure lowest in this diagram of an aerofoil in an airflow?

- a E
- b O
- c L
- d V

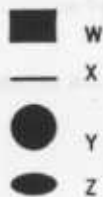


4 What is the chord line of a wing section?

- a The line at which the wing is set to the fuselage
- b A line through the leading edge, parallel to the thrust line
- c A curved line following the mean camber of the wing from the leading edge to the trailing edge
- d A straight line joining the leading edge to the trailing edge

5 Which one of these objects of equal width will produce the most drag in an airflow moving across the paper (parallel to the lines of writing):

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



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

- a 4
- b 2
- c 8
- d 6

7 The movement of an aircraft about its lateral axis is called:

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

8 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 Stability
- b Instability
- c Damping
- d Inertia

9 Which of these gives an aircraft stability in the yawing plane?

- a Anhedral
- b Dihedral
- c Sufficient fin area
- d High centre of gravity

10 What sort of movement is shown in the diagram?

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



11 What sort of movement is shown in the diagram?

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



- 12 Which of the following will occur when flap is lowered during the approach to land?
- a Lift will increase
 - b Stalling speed will be increased
 - c Drag will be reduced
 - d A higher touch-down speed will be needed

- 13 When slats are open on a wing, what effect will this have on the drag?
- a Decrease it
 - b No effect
 - c Reduce it to zero
 - d Increase it

- 14 A glider with a gliding angle of 1 in 40 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 20 kms
 - b 10 kms
 - c 40 kms
 - d 80 kms

- 15 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 35 kms
 - b 8.75 kms
 - c 17.5 kms
 - d 70 kms

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

- 17 How is horizontal flight achieved in a helicopter?
- a Increasing the rotor speed
 - b Tilting the rotor disc
 - c Decreasing the rotor speed
 - d Increasing the speed of the tail rotor

- 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 In order to control an aircraft in the yawing plane, the pilot of an aircraft fitted with conventional controls uses:
- a The rudder
 - b The ailerons
 - c The elevators
 - d The flaps

- 20 All the axes of rotation of an aircraft pass through:
- a A point halfway along a line between the wing tips
 - b Its centre of gravity
 - c Its centre of pressure
 - d A point halfway between the tail and the nose

- 21 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 Balance tabs
 - b Flaps
 - c Elevators
 - d Trimming tabs

- 22 The action of airbrakes on the wings of a glider is to:
- a Reduce lift and increase drag
 - b Increase lift and increase drag
 - c Reduce lift and reduce drag
 - d Increase lift and reduce drag

- 23 On this diagram, what does the arrow point to?

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



- 24 Which of these is used by the pilot to make the aircraft roll?
- a Rudder
 - b Fin
 - c Elevator
 - d Aileron

- 25 A helicopter pilot uses the collective pitch control mainly to control:
- a Horizontal flight
 - b Vertical flight
 - c Movement of the nose in the rolling plane
 - d Movement of the nose in the yawing plane