



Headquarters Air Cadets Examination

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.

1 Newton's 3rd law states that:

- a Every object has weight.
- b Every action has an equal and opposite reaction.
- c Every force causes an object to move.
- d Weight equals lift during flight.

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

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

3 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

4 If the air density in an airflow is reduced and all other factors are unchanged, what happens to the lift generated by a wing in the airflow?

- a It is increased
- b It is unchanged
- c It is reduced
- d It becomes unpredictable

5 Which of the following statements is true?

- a The stall is the same for all aircraft
- b The airspeed at which an aircraft stalls does vary
- c A wing can stall at any angle of attack
- d The airspeed at which an aircraft stalls does not vary

6 A stream line shape with an airspeed of 100 kts has a drag force of 200 N. If the airspeed is increased to 300 kts what will the drag be?

- a 3600 N
- b 800 N
- c 1800 N
- d 400 N

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

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

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

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

9 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



10 What sort of movement is shown in the diagram?

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



11 Which of these flap settings would a pilot most probably select, for a shorter take-off?

- a 15°
- b 120°
- c 90°
- d 60°

12 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 80 kms
- b 40 kms
- c 10 kms
- d 20 kms

13 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

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 Torque reaction
- d Pitching

15 When a helicopter rotor is driven in a circular motion there is an opposing force. What is this force called?

- a Lift
- b Lift reaction
- c Drag
- d Torque reaction

16 For a particular aircraft, which of these will reduce the stalling speed?

- a A reduction in power
- b Raising the flaps
- c Putting the aircraft into a turn
- d A reduction in weight

17 Which of the following is a simple flap?

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



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

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

19 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

20 All the axes of rotation of an aircraft pass through:

- a Its centre of gravity
- b A point halfway along a line between the wing tips
- c A point halfway between the tail and the nose
- d Its centre of pressure

21 When would a glider pilot use airbrakes?

- a When wanting to turn
- b When being winch-launched
- c When wanting to climb
- d When approaching to land

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

- a The opposite direction
- b At 90°
- c The same direction
- d At about 45°

23 All three axes of rotation of an aircraft pass through its:

- a Transition point
- b Centre of gravity
- c Aerodynamic centre
- d Centre of pressure

24 In this diagram what is the arrow pointing to?

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



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

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