



Headquarters Air Cadets Examination

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 The effect of gravity on an aircraft is called?

- a ☐ Thrust
- b ☐ Lift
- c ☐ Drag
- d ☐ Weight

2 Angle of attack means:

- a ☐ The angle between the chord line of the wing and the oncoming air
- b ☐ The angle of sweepback of a wing
- c ☐ The amount by which the aircraft's nose is above the horizon in level flight
- d ☐ The angle at which a wing is fixed to the fuselage

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

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

4 Which of the following will increase the stalling speed of an aircraft?

- a ☐ Putting it into a turn
- b ☐ Increasing the power setting
- c ☐ Lowering the flaps
- d ☐ Reducing the weight

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

- a ☐ 8
- b ☐ 2
- c ☐ 4
- d ☐ 6

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

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

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

- a ☐ Damping
- b ☐ Rolling
- c ☐ Yawing
- 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 ☐ Damping
- b ☐ Stability
- c ☐ Instability
- d ☐ Inertia

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

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

10 On this diagram what does the arrow point to?

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



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

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



12 In order to control an aircraft in the pitching plane, the pilot of an aircraft fitted with conventional controls uses?

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

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

- a ☐ 90degrees
- b ☐ 60degrees
- c ☐ 15degrees
- d ☐ 120degrees

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

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

15 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 ☐ 10 kms
- b ☐ 80 kms
- c ☐ 20 kms
- d ☐ 40 kms

16 A helicopters rotor disc is?

- a ☐ Controlled by the yaw pedals
- b ☐ The area swept by the rotor blades
- c ☐ Used to programme the path of the helicopter
- d ☐ Only used when hovering

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

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

18 What is the purpose of a helicopter's tail rotor?

- a ☐ Counter torque reaction
- b ☐ Provide thrust
- c ☐ Control the aircraft in the rolling plane
- d ☐ Reduce drag

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

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

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

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

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

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

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

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

23 Only one of these statements is true for an aircraft in straight and level flight. Which one?

- a ☐ Lift is slightly more than weight
- b ☐ Lift exactly equals weight
- c ☐ Lift is slightly less than weight
- d ☐ Lift is considerably greater than weight

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

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

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

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

