



Headquarters Air Cadets Examination

Leading Cadet
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 ☐ Lift
- b ☐ Thrust
- c ☐ Weight
- d ☐ Drag

2 For air moving in a smooth streamline flow, if the air is made to speed up, what happens to the pressure of the air where it is flowing faster?

- a ☐ It remains constant
- b ☐ It fluctuates wildly
- c ☐ It increases
- d ☐ It decreases

3 In what direction does lift operate relative to airflow?

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

4 What is the chord line of a wing section?

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

5 Which of these wing sections are for high lift?

- a ☐ W
- b ☐ Y
- c ☐ Z
- d ☐ X



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

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

7 To slow an aircraft from straight and level flight which of the following statements is true?

- a ☐ Thrust must equal drag
- b ☐ Drag must exceed thrust
- c ☐ Thrust must exceed drag
- d ☐ Drag must be half thrust

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

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

9 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 ☐ Inertia
- d ☐ Damping

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

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



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

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



12 Which of the following will occur when flap is lowered during the approach to land?

- a ☐ A higher touch-down speed will be needed
- b ☐ Stalling speed will be increased
- c ☐ Lift will increase
- d ☐ Drag will be reduced

13 When slats are open on a wing, what effect will this have on the drag?

- a ☐ Increase it
- b ☐ No effect
- c ☐ Decrease it
- d ☐ Reduce it to zero

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 ☐ 80 kms
- b ☐ 10 kms
- c ☐ 40 kms
- d ☐ 20 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 ☐ 70 kms
- c ☐ 17.5 kms
- d ☐ 8.75 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 ☐ Pitching
- b ☐ Torque reaction
- c ☐ Collective pitch
- d ☐ Cyclic pitch

17 How is horizontal flight achieved in a helicopter?

- a ☐ Decreasing the rotor speed
- b ☐ Tilting the rotor disc
- c ☐ Increasing the speed of the tail rotor
- d ☐ Increasing the rotor speed

18 Why is lift produced when air flows over the top surface of a wing?

- a ☐ The air pressure falls because the air is speeded up
- b ☐ The air pressure rises because the air is slowed down
- c ☐ The air pressure rises because the air is speeded up
- d ☐ The air pressure falls because the air is slowed down

19 On this diagram what does the arrow point to?

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



20 Which of the following is a simple flap?

- a ☐ W
- b ☐ Z
- c ☐ X
- d ☐ Y



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

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

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

23 The action of airbrakes on the wings of a glider is to:

- a ☐ Increase lift and reduce drag
- b ☐ Reduce lift and increase drag
- c ☐ Reduce lift and reduce drag
- d ☐ Increase lift and increase drag

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

25 A helicopter pilot uses the collective pitch control mainly to control:

- a ☐ Vertical flight
- b ☐ Horizontal flight
- c ☐ Movement of the nose in the yawing plane
- d ☐ Movement of the nose in the rolling plane