



Headquarters Air Cadets Examination

Leading Cadet
33/2 Principles of Flight
Generated 06-Aug-03

Serial: 508

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 Which scientist formulated laws, one of which says that every action has an equal and opposite reaction?

- a ☐ Riddely
- b ☐ Einstein
- c ☐ Morgan
- d ☐ Newton

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

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

3 Where is the greatest amount of lift normally generated on an aerofoil?

- a ☐ Bottom surface
- b ☐ Top surface
- c ☐ Trailing edge
- d ☐ Leading edge

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

5 Which of these wing sections is for general purpose?

- a ☐ Y
- b ☐ X
- c ☐ W
- d ☐ Z



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

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

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

- a ☐ Thrust must be less than drag
- b ☐ Drag must be greater than thrust
- c ☐ Thrust must equal total drag
- d ☐ Thrust must exceed total drag

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

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

9 The 3 axes about which an aircraft moves are?

- a ☐ Lateral, normal and diagonal
- b ☐ Longitudinal, lateral and diagonal
- c ☐ Longitudinal, lateral and normal
- d ☐ Lateral, bilateral and normal

10 What part of an aircraft provides stability in the pitching plane?

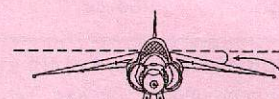
- a ☐ The fin
- b ☐ The nose
- c ☐ The tail plane
- d ☐ The undercarriage

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

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

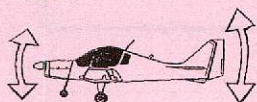
12 This aircraft is flying towards you. What angle is the arrow pointing to?

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



13 What sort of movement is shown in the diagram?

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



14 Aircraft movements such as pitching, rolling and yawing are always described in relation to the?

- a ☐ Pilot
- b ☐ Ground
- c ☐ Airflow
- d ☐ Horizon

15 A pilot selects full flap when coming into land. This will?

- a ☐ Reduce the angle of approach and improve the forward vision
- b ☐ Decrease the angle of approach and reduce the landing run
- c ☐ Increase the angle of approach and improve forward vision
- d ☐ Increase the angle of approach and increase the landing run

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

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

17 A glider with a flying speed of 35 kts flies into a head wind of 35 kts. To an observer on the ground the glider will appear to?

- a ☐ Climb steadily
- b ☐ Cover the ground at 35 kts
- c ☐ Lose height slowly over one spot
- d ☐ Cover the ground at 70 kts

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

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

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

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

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

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

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

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

24 Which of these is used by the pilot to make the aircraft roll?

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

25 Which of the following is a Fowler flap?

- a ☐ Y
- b ☐ X
- c ☐ W
- d ☐ Z

