

Headquarters Air Cadets Examination

Leading Cadet
Principles of Flight

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Serial: 81

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

Group 6.

- 1 Newton's 3rd law states that:
 - a Every action has an equal and opposite reaction.
 - b Weight equals lift during flight.
 - c Every force causes an object to move.
 - d Every object has weight.

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

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

- 3 As air passes over the top surface of a wing in normal flight, its speed will:

- a Reduce considerably
- b Reduce slightly
- c Increase
- d Remain constant

- 4 The centre of pressure on an aerofoil is?

- a The point at which all the weight is said to act
- b Two thirds of the way along the chord line, measured from the leading edge
- c Half way along the chord line
- d The point at which all the lift is said to act

- 5 Which of these wing sections is for general purpose?

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



- 6 What is the force called that resists the forward motion of an aircraft?

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

- 7 Each of the three axes of an aircraft pass through the aircraft's:

- a Centre of gravity
- b Wings
- c Engine bearings
- d Cockpit

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

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

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

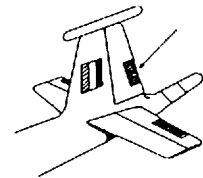
- a The undercarriage
- b The fin
- c The tail plane
- d The nose

- 10 Which of these gives an aircraft directional stability?

- a Small fin area
- b Low centre of gravity
- c Rearward centre of gravity
- d Large fin area

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

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



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

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

- 13 What is the purpose of a slat on an aerofoil?

- a To reduce the drag at high speeds
- b To improve handling at high speed
- c To make the air turbulent at low speeds
- d To improve handling at low speed

- 14 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?
- Lose height slowly over one spot
 - Climb steadily
 - Cover the ground at 35 kts
 - Cover the ground at 70 kts

- 15 The lift of a helicopter blade can be increased by?

- Pointing the nose into wind
- Increasing the pitch angle
- Decreasing the pitch angle
- Slowing the rotor head down

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

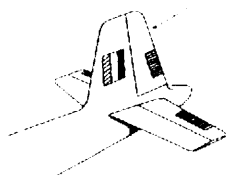
- Lift
- Lift reaction
- Drag
- Torque reaction

- 17 When the pilot of a helicopter makes a large upwards movement of the collective lever more power is required. How is this extra power obtained?

- An automatic cam arrangement opens the engine throttle and no further action is required
- The pilot turns the hand throttle to open it
- The cyclic pitch is altered taking the load off the tail rotor
- The yaw pedals are operated to increase the load on the engine

- 18 On this diagram what does the arrow point to?

- Rudder
- Fin
- Aileron
- Fuselage



- 19 Which of these describes the effect of slats at low speeds?

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

- 20 The point on a wing at which all the lift is said to act is called:

- Centre of pressure
- Dynamic centre
- Static point
- Pressure point

- 21 If an aircraft in steady straight and level flight suffered a sudden reduction in weight (for example, by jettisoning fuel), and the pilot made no changes to the controls, the aircraft would begin to:

- Slow down
- Descend
- Speed up
- Climb

- 22 When the angle of attack of a general purpose wing increases beyond about 15° the airflow becomes turbulent and lift decreases rapidly. This sudden loss of lift is known as:

- The spin
- The stall
- The vortex
- Boundary layer separation

- 23 A helicopter pilot uses the yaw pedals to control:

- Forward speed
- The tail rotor
- Vertical flight
- The pitch angle of the main rotor blades

- 24 The reaction to the rearward movement of air produced by the propeller or jet is called:

- Drag
- Thrust
- Resistance
- Friction

- 25 On this cross-section of a wing, which arrow points to a flap?

- S
- U
- R
- T

