



Headquarters Air Cadets Examination

Leading Cadet
33/2 Principles of Flight
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Serial: 575

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?

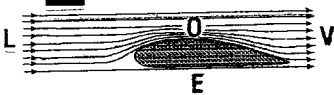
- a Morgan
- b Newton
- c Riddely
- d Einstein

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 Where is the air pressure lowest in this diagram of an aerofoil in an airflow?

- a V
- b E
- c O
- d L

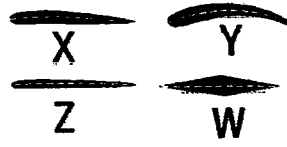


4 Angle of attack means:

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

5 Which of these wing sections are for high lift?

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



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

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

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

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

8 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 400 N
- b 800 N
- c 1800 N
- d 3600 N

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

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

10 The 3 axes about which an aircraft moves are?

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

11 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 Instability
- c Inertia
- d Stability

12 Which of these gives an aircraft high directional stability?

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

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

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



14 On this diagram what does the arrow point to?

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



15 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 Drag will be reduced
- c Lift will increase
- d Stalling speed will be increased

16 To obtain the maximum drag from an aircraft's flaps, they should be set to?

- a 10degrees
- b 90degrees
- c 40degrees
- d 30degrees

17 A glider with a gliding angle of 1 in 20 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 20 kms
- b 8.75 kms
- c 5 kms
- d 10 kms

18 A helicopters rotor disc is?

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

19 Where is the hand throttle of a helicopter located?

- a At the top of the joy stick
- b On the cockpit wall
- c On the end of the collective lever
- d On the cyclic control

20 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?

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

21 The pitch angle of a helicopters rotor blades can be altered individually, as each one traverses the plane of rotation. This is called?

- a Cyclic pitch
- b Pitching
- c Collective pitch
- d Torque reaction

22 A helicopter pilot uses the yaw pedals to control:

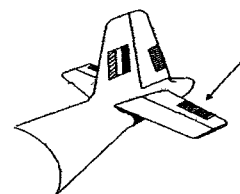
- a The tail rotor
- b Forward speed
- c The pitch angle of the main rotor blades
- d Vertical flight

23 In steady straight and level flight at constant height and speed, the amount of lift produced by the aircraft must be:

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

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 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