



Headquarters Air Cadets Examination

Leading Cadet
33/2 Principles of Flight
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Serial: 272

- Use black or dark blue pen, NOT pencil.
- Mark one answer per question with a cross.
- 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 Newton's 3rd law states that:

- a Every object has weight.
- b Weight equals lift during flight.
- c Every force causes an object to move.
- d Every action has an equal and opposite reaction.

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

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

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

- a Top surface
- b Bottom 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 reduced
- b It is increased
- c It is unchanged
- d It becomes unpredictable

5 The resistance to the forward movement of an aircraft is called?

- a Drag
- b Resistance
- c Turbulence
- d Thrust

6 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 1800 N
- b 3600 N
- c 400 N
- d 800 N

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

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

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

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

9 On this diagram what does the arrow point to ?

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



10 What is the purpose of the trimming tabs on flying controls?

- a To increase the approach angle during landing
- b To improve the manoeuvrability of the aircraft
- c To cancel out the unwanted forces on the pilots controls
- d To reduce the take off run of an overloaded aircraft

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

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

12 Name the three forces acting on a glider in a steady flight?

- a Drag, thrust and lift
- b Drag, weight and lift
- c Drag, weight and thrust
- d Thrust, weight and lift

13 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 5 kms
- b 10 kms
- c 20 kms
- d 8.75 kms

14 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 8.75 kms
- d 17.5 kms

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

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

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

17 What is the main function of a helicopter's cyclic control?

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

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

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

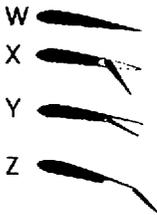
19 On an aircraft, if the airspeed over a wing is trebled, and all other factors affecting lift are unchanged, the lift is:

- a Multiplied by about 3
- b Divided by about 3
- c Unchanged
- d Multiplied by about 9

20 Which of these statements, about the airflow over the wing of an aircraft just beyond the point of stall is true?

- a It stops completely
- b It speeds up tremendously
- c It becomes turbulent
- d It becomes very smooth

21 Which of the following is a split flap?

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

22 In what direction relative to the direction of the oncoming air, or path of the aircraft, do the lift forces act?

- a At about 4 degrees
- b The opposite direction
- c At 90 degrees
- d The same direction

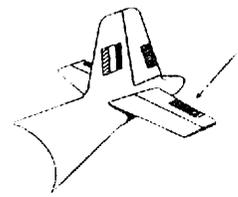
23 Which of these wing sections are for high speed?

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



24 In this diagram what is the arrow pointing to?

- a A rudder trimming tab
- b An elevator trimming tab
- c A fin
- d A fuselage



25 Which of the following is a Fowler flap?

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

