



Headquarters Air Cadets Examination

Leading Cadet
33/2 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 Newton's 3rd law states that:

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

2 The effect of gravity on an aircraft is called?

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

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

- a ☐ L
b ☐ V
c ☐ E
d ☐ O

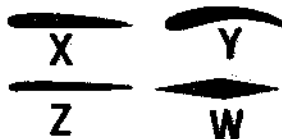


4 What is the chord line of a wing section?

- a ☐ A line through the leading edge, parallel to the thrust line
b ☐ A curved line following the mean camber of the wing from the leading edge to the trailing edge
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 is for general purpose?

- a ☐ Z
b ☐ Y
c ☐ X
d ☐ W



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

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

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

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

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

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

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

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

10 Which of the following will give an aircraft stability in the rolling plane?

- a ☐ A large fin area
b ☐ Dihedral
c ☐ A small fin area
d ☐ Anhedral

11 What sort of movement is shown in the diagram?

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



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

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

14. What is the purpose of the trimming tabs on flying controls?

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

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

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

16. A helicopter generates lift by:

- a ☐ Spinning aerofoil shaped blades
- b ☐ Use of the engine exhaust
- c ☐ Spinning an aerofoil shaped tail rotor
- d ☐ Using the torque reaction

17. What is the purpose of a helicopter's tail rotor?

- a ☐ Counter torque reaction
- b ☐ Provide thrust
- c ☐ Reduce drag
- d ☐ Control the aircraft in the rolling plane

18. For low subsonic speeds, if the airspeed is doubled and all other factors affecting lift are unchanged, the lift is:

- a ☐ Multiplied by 2
- b ☐ Unchanged
- c ☐ Multiplied by 4
- d ☐ Multiplied by 8

18. In order to control an aircraft in the yawing plane, the pilot of an aircraft fitted with conventional controls uses:

- a ☐ The elevators
- b ☐ The flaps
- c ☐ The ailerons
- d ☐ The rudder

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

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

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

- a ☐ The spin
- b ☐ The stall
- c ☐ The vortex
- d ☐ Boundary layer separation

21. All the axes of rotation of an aircraft pass through:

- a ☐ Its centre of gravity
- b ☐ Its centre of pressure
- c ☐ A point halfway along a line between the wing tips
- d ☐ A point halfway between the tail and the nose

22. When would a glider pilot use airbrakes?

- a ☐ When approaching to land
- b ☐ When being winch-launched
- c ☐ When wanting to turn
- d ☐ When wanting to climb

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

- a ☐ Resistance
- b ☐ Drag
- c ☐ Thrust
- d ☐ Friction

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

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

25. Which of the following is a Fowler flap?

- a ☐ Y
- b ☐ X
- c ☐ W
- d ☐ Z

