



# Headquarters Air Cadets Examination

Leading Cadet  
33/2 Principles of Flight  
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Serial: 295

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 \_\_\_\_\_

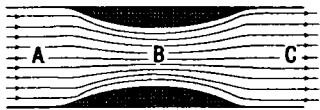
Date of Birth \_\_\_\_\_

Squadron/Unit \_\_\_\_\_

Wing \_\_\_\_\_

1 In the diagram, air is flowing past a constriction. What has happened to the air pressure at point B?

- a  It is lower than at point A
- b  It is greater than at point C
- c  It is greater than at point A
- d  It is the same as at point C



4 If you doubled the airspeed the drag would increase by a factor of?

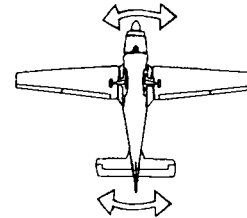
- a  6
- b  2
- c  8
- d  4

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

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

9 What sort of movement is shown in the diagram?

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



2 Which of these wing sections is for general purpose?

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



6 The movement of an aircraft about its longitudinal axis is called?

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

10 Which of these is used by the pilot to make the aircraft yaw?

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

3 Which of the following statements is true?

- a  The airspeed at which an aircraft stalls does vary
- b  The airspeed at which an aircraft stalls does not vary
- c  The stall is the same for all aircraft
- d  A wing can stall at any angle of attack

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

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

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

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

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

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

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

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



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  8.75 kms
- c  20 kms
- d  10 kms

14 A helicopter generates lift by using

- a  The tail rotor
- b  The torque reaction
- c  The engine exhaust
- d  Spinning blades

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

16 What shape is the cross section of a helicopter blade?

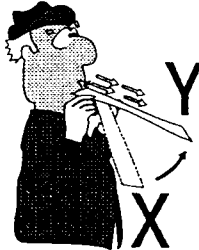
- a  Aerofoil
- b  Triangular
- c  Round
- d  Square

17 Which of the following is true? A particular wing will stall:

- a  Only when its nose is well above the horizon
- b  Only below a particular airspeed
- c  Always at the same airspeed
- d  Always at the same angle of attack

18 When this person blows along the top of the paper, the paper rises from position X to position Y because of:

- a  A reduction in the air pressure along the top of the paper
- b  A rise in the air pressure along the top of the paper
- c  The skin friction which develops along the top of the paper
- d  The vortices which form along the top of the paper



19 Lift is obtained from almost all parts of the wing but not equally from every part. About how much is obtained from the top surface of an aircraft wing such as a Chipmunk:

- a  Up to 33%
- b  Up to 25%
- c  Up to 80%
- d  Up to 50%

20 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

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

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

22 The movement of an aircraft about its normal axis is called:

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

23 At position 1, the aircraft is climbing vertically. To make the aircraft move to position 2 and then to position 3, the pilot must move the control column:

- a  Back
- b  Forward
- c  To the right
- d  To the left



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

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

25 When a glider pilot operates the airbrakes what is the effect?

- a  Lift is reduced and drag is reduced
- b  Lift is reduced and drag is increased
- c  Lift is increased and drag is reduced
- d  Lift is increased and drag is increased