Headquarters Air Cadets
Examination

Leading Cadet
33/2 Principles of Flight
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Serial: 459

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 Initals _____ Date of Exam _____

Date of Birth _____ Squadron/Unit _____ Wing _____

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

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

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

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

3 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

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

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

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

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

6 Which axis runs from nose to tail in an aircraft?

a ☐ Bilateral
b ☐ Lateral
c ☐ Longitudinal
d ☐ Normal

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

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

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

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

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

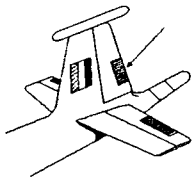
a ☐ Lift angle
b ☐ Cohedral angle
c ☐ Dihedral angle
d ☐ Anhedral angle

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

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

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

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



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

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

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

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

14 A helicopters rotor disc is?

a ☐ Controlled by the yaw pedals

b ☐ Only used when hovering

c ☐ Used to programme the path of the helicopter

d ☐ The area swept by the rotor 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 ☐ Torque reaction

b ☐ Collective pitch

c ☐ Pitching

d ☐ Cyclic pitch

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

a ☐ Travel forwards

b ☐ Climb

c ☐ Travel backwards

d ☐ Hover

17 Why is lift produced when air flows over the top surface of a wing?

a ☐ The air pressure rises because the air is speeded up

b ☐ The air pressure rises because the air is slowed down

c ☐ The air pressure falls because the air is speeded up

d ☐ The air pressure falls because the air is slowed down

18 Which of these statements, about an aircraft in steady straight and level flight, is true?

a ☐ Thrust is equal to the drag

b ☐ Thrust is equal to twice the drag

c ☐ Thrust is equal to half the drag

d ☐ Thrust is equal to four times the drag

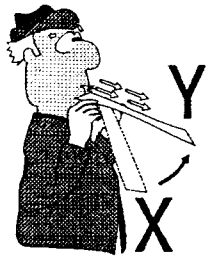
19 When this person blows along the top of the paper, the paper rises from position X to position Y because of:

a ☐ A rise in the air pressure along the top of the paper

b ☐ The skin friction which develops along the top of the paper

c ☐ A reduction in the air pressure along the top of the paper

d ☐ The vortices which form along the top of the paper



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

a ☐ Centre of pressure

b ☐ Static point

c ☐ Dynamic centre

d ☐ Pressure point

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

a ☐ Pitching

b ☐ Damping

c ☐ Rolling

d ☐ Yawing

22 A designer needs one shape of wing for the highest possible flying speed- but another for the slowest possible landing speed. What does he provide to enable one wing to achieve both?

a ☐ Trimming tabs

b ☐ Flaps

c ☐ Balance tabs

d ☐ Elevators

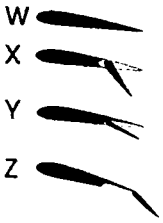
23 Which of the following is a split flap?

a ☐ X

b ☐ Y

c ☐ W

d ☐ Z



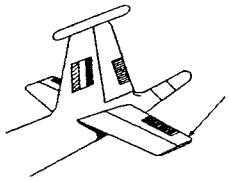
24 On this diagram, what does the arrow point to ?

a ☐ Elevator

b ☐ Rudder

c ☐ Fuselage

d ☐ Fin



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

a ☐ Fin

b ☐ Rudder

c ☐ Aileron

d ☐ Elevator