Exam Number:-20.

----

1. When air flow velocity over an upper cambered surface of an aerofoil decreases, what takes place?

a) Pressure increases, lift decreases
b) Pressure increases, lift increases
c) Pressure decreases, lift increases

2. When an aircraft stalls

a) lift and drag increase
b) lift increases and drag decreases
c) lift decreases and drag increases

3. Wing loading is

a) the maximum all up weight multiplied by the total wing area
b) the maximum all up weight divided by the total wing area
c) the ratio of the all up weight of the aircraft to its basic weight

4. An aircraft wing with an aspect ration of 6:1 is proportional so that

a) the mean chord is six times the thickness
b) the wing span is six times the mean chord
c) the wing area is six times the span

5. Upward and outward inclination of a mainplane is termed

a) sweep
b) dihedral
c) stagger

6. The function of an aircraft fin

a) is to provide stability about the normal axis
b) is to provide directional control
c) is to provide straight airflow across the rudder

7. Movement of an aircraft about its normal axis

a) is pitching
b) is rolling
c) is yawing

8. A pressure of one atmosphere is equal to

a) 14.7 psi
b) 100 millibar

c) 1 inch Hg.

9. The millibar is a unit of
a) atmospheric temperature
b) pressure altitude
c) barometric pressure

10. With an increase in altitude under I.S.A. conditions the temperature in the troposphere

a) increases
b) decreases
c) remains constant
==
ans[1] = "a";
ans[2] = "c";
ans[3] = "b";
ans[4] = "b";
ans[5] = "b";
ans[6] = "a";
ans[7] = "c";
ans[8] = "a";
ans[9] = "c";
ans[10] = "c";

explain[1]="When airflow velocity over the upper cambered surface of an aerofoil DECREASES, the pressure increases and thus the lift decreases.";
explain[2]="When an aircraft stalls the drag increases and the lift decreases.";
explain[3]="Wing Loading is maximum all-up-weight divided by wing area. Measured in Newtons per Square Metre.";
explain[4]="If aspect ratio is 6:1 the wing span is 6 times the mean chord.";
explain[5]="Upward and outward inclination of a mainplane is termed dihedral.";
explain[6]="The function of the aicraft fin is to provide stability about the normal axis.";
explain[7]="'yawing' is movement of the aircraft about its normal axis.";
explain[8]="One atmosphere is 14.7 psi.";
explain[9]="Barometric pressure is measured in millibar.";
explain[10]="Temperature is constant in the troposphere.";

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Exam Number:-21.

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1.   Which of the following forces act on an aircraft in level flight?

a) Lift, thrust, and weight
b) Lift, thrust, weight, and drag
c)   Lift, drag, thrust

2.   When an aircraft is banked, the horizontal component of the lift

a) will tend to make the aircraft follow a circular path
b) will oppose the tendency of the aircraft to follow a circular path
c)   will oppose the weight thus requiring more total lift in the turn

3.   If, after a disturbance, an aeroplane initially returns to its equilibrium state

a) it has neutral stability
b) it has static stability and may be dynamically stable
c)   it is neutrally unstable

4.   Stability of an aircraft is

a) the tendency of the aircraft to return to its original trimmed position after having been displaced
b) the ability of the aircraft to rotate about an axis
c)   the tendency of the aircraft to stall at low airspeeds

5.   With reference to altimeters QFE is

a) setting aerodrome atmospheric pressure so that an altimeter reads zero on landing and take off
b) quite fine equipment
c)   the manufacturers registered name

6.   Under the ICAO "Q" code there are which three settings?

a) QFE , QNH , QNE
b) QEF , QNH , QEN
c)   QE , QN , QQE

7.   Wing loading is

a) GROSS WEIGHT divided by GROSS WING AREA
b) WING AREA x WING CHORD
c)   the ultimate tensile strength of the wing

8.   The three axes concerned with stability of an aircraft have
a) normal axis through C of G. Lateral axis - wing tip to wing tip. Longitudinal axis - nose to tail but not through C of G
b) longitudinal, lateral and normal axis all passing through aircraft centre of gravity
c)   longitudinal axis nose to tail, lateral axis at furthest span point, normal axis through centre of pressure

9.   A barometer indicates

a) pressure
b) density
c)   temperature

10.   If an aircraft returns to a position of equilibrium it is said to be
a) negatively stable
b) neutrally stable
c)   positively stable
==
ans[1] = "b";
ans[2] = "a";
ans[3] = "b";
ans[4] = "a";
ans[5] = "a";
ans[6] = "a";
ans[7] = "a";
ans[8] = "b";
ans[9] = "a";
ans[10] = "c";

explain[1]="Lift, thrust, weight and drag act on an aircraft in level flight.";
explain[2]="When an aircraft is banked, the horizontal component of lift makes the aircraft follow a circular path.";
explain[3]="Static stability is when an aircraft returns to its equilibrium (trimmed) state. Dynamis stability is the ability of the aircraft to oppose the disturbance";
explain[4]="Stability is the tendancy for the aircraft to return to its original position after being displaced.";
explain[5]="Q is the mathematical symbol for pressure. FE stands for Filed Elevation. QFE regfers to setting the altimeter to aerodrome atmospheric pressure so the altimeter reads zero on landing and takeoff.";
explain[6]="The ICAO 'Q' codes are QFE. QNE, QNH.";
explain[7]="Wing loading is gross weight divided by wing area measured in Newtons per Square Metre.";
explain[8]="The longitudinal, lateral and normal axis all pass through the aircraft's centre of gravity.";
explain[9]="A barameter indicates pressure.";
explain[10]="If an aircraft is positively stable it will return to its trimmed position.";

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Exam Number:-22.

----

1.   The pendulum effect on a high wing aircraft

a) increases lateral stability
b) decreases lateral stability
c)   has no effect on lateral stability

2.   The amount of water vapour in the air (humidity holding capacity of the air) is

a) greater on a colder day, and lower on a hotter day
b) greater on a hotter day and lower on a colder day
c)   doesn't have a significant difference

3.   Weight is equal to

a) volume x gravity
b) mass x acceleration
c)   mass x gravity

4.   Induced Drag

a) increases with an increase in speed
b) reduces with an increase in angle of attack
c)   increases with increase in aircraft weight

5.   Airflow over the upper surface of the wing generally

a) flows towards the root
b) flows towards the tip
c)   flows straight from leading edge to trailing edge

6.   With an increase in aspect ratio for a given ISA, induced drag will

a) remain constant
b) increase
c)   reduce

7.   With increasing altitude the angle at which a wing will stall

a) remains the same
b) reduces
c)   increases

8.   If the density of the air is increased, the lift will

a) increase
b) decrease

c) remain the same

9. All the factors that affect the lift produced by an aerofoil are

a) angle of attack, air density, velocity, wing area
b) angle of attack, air temperature, velocity, wing area
c) angle of attack, velocity, wing area, aerofoil shape, air density

10. A wing section suitable for high speed would be
a) thick with high camber
b) thin with high camber
c) thin with little or no camber

=======================================

ans[1] = "a";
ans[2] = "b";
ans[3] = "b";
ans[4] = "c";
ans[5] = "b";
ans[6] = "c";
ans[7] = "a";
ans[8] = "a";
ans[9] = "c";
ans[10] = "c";

explain[1]="Pendulum effect on a high wing aircraft increases lateral stability.";
explain[2]="The amount of water vapour in the air is greater on a hotter day.";
explain[3]="Weight = mass x gravity.";
explain[4]="Induced drag increase with aircraft weight because it is 'lift dependant drag'.";
explain[5]="Due to wing tip vortices there is a general flow of air from tip to root on the top surface, and root to tip on the lower surface.";
explain[6]="A long slender wing (high aspect ratio) has a high induced drag.";
explain[7]="The angle at which a wing stalls does not chang - only the stall speed changes.";
explain[8]="See the formula for lift. Lift is directly proportional to air density.";
explain[9]="Lift formula is CL (includes aerofoil shape and angle of attack) x 1/2 x air density x velocity squared.";
explain[10]="A high speed wing is this with little or no camber.";

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Exam Number:-23.

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1. The induced drag of an aircraft

a) increases with increasing speed
b) increases if aspect ratio is increased
c) decreases with increasing speed

2. As the speed of an aircraft increases the profile drag

a) increases
b) decreases
c) decreases at first then increase

3. The stagnation point on an aerofoil is the point where

a) the suction pressure reaches a maximum
b) the boundary layer changes from laminar to turbulent
c) the airflow is brought completely to rest

4. After a disturbance in pitch, an aircraft continues to oscillate at constant amplitude. It is

a) longitudinally unstable
b) longitudinally neutrally stable
c) laterally unstable

5. On an aircraft with an all-moving tailplane nose up pitch is caused by

a) increasing tailplane incidence
b) decreasing tailplane incidence
c) up movement of the trim tab

6. The stalling of an aerofoil is affected by the

a) airspeed
b) angle of attack
c) transition speed

7. What gives the aircraft directional stability?
a) Vertical stabiliser
b) Horizontal stabiliser
c) Elevators

8. The most fuel efficient of the following types of engine is the

a) rocket
b) turbo-jet engine
c) turbo-fan engine

9.   The quietest of the following types of engine is the

a) rocket
b) turbo-jet engine
c)   turbo-fan engine

10.   Forward motion of a glider is provided by

a) the engine
b) the weight
c)   the drag
=======================================
ans[1] = "c";
ans[2] = "a";
ans[3] = "c";
ans[4] = "b";
ans[5] = "b";
ans[6] = "b";
ans[7] = "a";
ans[8] = "c";
ans[9] = "c";
ans[10] = "b";

explain[1]="Induced drag decreases with increasing speed.";
explain[2]="Profile drag increases with increasing speed.";
explain[3]="The stagnation point on the aerofoil is the point where the airflow is brought completely to rest on the leading edge.";
explain[4]="If an aircraft oscillates in pitch without the oscillations increasing or decreasing it is longitudinally neutrally stable.";
explain[5]="To make the nose pitch up, the tailplane down load must be increased. This is done by decreasing its incidence (or increasing its negative incidence).";
explain[6]="The stall position of an aerofoil is determined by its angle of attack only.";
explain[7]="The vertical stabiliser gives the aircraft directional stability.";
explain[8]="The turbo fan is the most fuel efficient engine.";
explain[9]="The turbo fan is the quietest engine.";
explain[10]="The weight provides forward motion of a glider.";

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Exam Number:-24.

----

1.   Profile drag consists of what drag types?

a) Form, skin friction and interference
b) Form, induced and skin friction
c)   Form, induced and interference

2.   An aircraft in straight and level flight is subject to

a) zero load factor
b) a load factor of 1
c)   a load factor of ½

3.   Aspect ratio is given by the formula

a) Mean Chord
Span
b) Span2
Area
c)   Span2
Mean Chord

4.   On a high wing aircraft in a turn

a) the up going wing loses lift which has a de-stabilizing effect
b) the down going wing gains lift causing a stabilizing effect
c)   the down going wing loses lift causing a de-stabilizing effect

5.   Which condition is the actual amount of water vapour in a mixture of air and water?

a) Relative humidity
b) Dew point
c)   Absolute humidity

6.   An aspect ratio of 8 means
a) the span is 8 times the mean chord
b) the mean chord is 8 times the span
c)   the area is 8 times the span

7.   The ISA
a) is taken from the equator
b) is taken from 45 degrees latitude
c)   assumes a standard day

8.   Which will weigh the least?
a) 98 parts of dry air and 2 parts of water vapour
b) 35 parts of dry air and 65 parts of water vapour

c)   50 parts of dry air and 50 parts of water vapour

9.   A high aspect ratio wing
a) is stiffer than a low aspect ratio wing
b) has less induced drag than a low aspect ratio wing
c)   has a higher stall angle than a low aspect ratio wing

10.   The thrust-drag couple overcomes the lift-weight couple. What force must the tail of the aircraft exert to maintain the aircraft in a level attitude?
a) Down
b) Up
c)   Sideways
==
ans[1] = "a";
ans[2] = "b";
ans[3] = "b";
ans[4] = "b";
ans[5] = "c";
ans[6] = "a";
ans[7] = "b";
ans[8] = "a";
ans[9] = "b";
ans[10] = "b";

explain[1]="Profile consists of Form Drag, Skin Friction Drag and Interference Drag.";
explain[2]="An aircraft in straight and level flight is subject to a load factor of 1 (i.e. 1g).";
explain[3]="Aspect Ratio is span / mean chord. Multiply top and bottom by span and you get span squared / area.";
explain[4]="When an aircraft roles, the downgoing wing gains lift (due to the upflow of air causing an increased angle of attack). This opposes the role.";
explain[5]="Absolute humidity is the 'actual' amount of water in a mixture of air and water.";
explain[6]="An Aspect Ratio of 8 means the span is 8 times the chord.";
explain[7]="The ISA is taken from 45 degrees latitude.";
explain[8]="Dry air is heavier than water vapour.";
explain[9]="A long slender wing (high aspect ratio) has less induced drag than a short stubby wing.";
explain[10]="Assuming the thrust-drag couple is a nose up couple (low engined aircraft) then if the thrust-drag couple overcomes the lift-weight couple, the aircraft will pitch up. The tail of the aircraft needs to exert an upwards force to maintain level flight.";

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Exam Number:-25.

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1.   Induced downwash

a) reduces the effective angle of attack of the wing
b) increases the effective angle of attack of the wing
c)   has no effect on the angle of attack of the wing

2.   During a turn, the stalling angle

a) increases
b) decreases
c)   remains the same

3.   Which is the ratio of the water vapour actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure?
a) Absolute humidity
b) Relative humidity.
c)   Dew point

4.   A straight rectangular wing, without any twist, will

a) have greater angle of attack at the tip
b) have the same angle of attack at all points along the span
c)   have less angle of attack at the tip

5.   If gauge pressure on a standard day is 25 PSI, the absolute pressure is

a) 10.3 PSI
b) 43.8 PSI
c)   39.7 PSI

6.   The C of G moves in flight. The most likely cause of this is

a) movement of passengers
b) movement of cargo
c)   consumption of fuel and oils

7.   The speed of sound in the atmosphere

a) varies according to the frequency of the sound
b) changes with a change in temperature
c)   changes with a change in pressure

8.   A straight rectangular wing, without any twist, will
a) stall first at the tip
b) stall first at the root
c)   stall equally along the span of the wing

9.   What is sea level pressure?

a) 1013.2 mb
b) 1012.3 mb
c)   1032.2 mb

10.   Which atmospheric conditions will cause the true landing speed of an aircraft to be the greatest?

a) Low temperature with low humidity
b) High temperature with low humidity
c)   High temperature with high humidity
==
ans[1] = "a";
ans[2] = "c";
ans[3] = "b";
ans[4] = "c";
ans[5] = "c";
ans[6] = "c";
ans[7] = "b";
ans[8] = "b";
ans[9] = "a";
ans[10] = "c";

explain[1]="Induced downwash reduces the effective angle of attack of the wing.";
explain[2]="The stalling ANGLE does not change. Only the stall speed changes.";
explain[3]="Relative humidity is the ratio of the water vapour actually present to the water vapour that the air would hold if it were saturated.";
explain[4]="Due to wingtip vortices, there is more downwash at the tip, and therefore there is less angle of attack at the tip.";
explain[5]="Absolute pressure = gauge pressure plus atmospheric pressure. Atmospheric pressure is 14.7 PSI.";
explain[6]="Consumption of fuel and oil causes the C of G to move in flight.";
explain[7]="Speed of sound is affected by air temperature.";
explain[8]="A straight rectangular wing will stall first at the root. This is because the effective angle of attack is reduced at the tips because of the greater downwash at the tips.";
explain[9]="Sea level pressure is 1013.2 mb.";
explain[10]="High temperature and high humidity are the worst conditions for aircraft performance.";

==

Exam Number:-26.

----

1. Which condition is the actual amount of water vapour in a mixture of air and water?

a) Relative humidity
b) Dew point
c) Absolute humidity

2. When the weight of an aircraft increases, the minimum drag speed

a) decreases
b) increases
c) remains the same

3. Which statement concerning heat and/or temperature is true?

a) There is an inverse relationship between temperature and heat.
b) Temperature is a measure of the kinetic energy of the molecules of any substance
c) Temperature is a measure of the potential energy of the molecules of any substance

4. Which is the ratio of the water vapour actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure?

a) Absolute humidity
b) Relative humidity
c) Dew point

5. When an aircraft experiences induced drag

a) air flows under the wing spanwise towards the tip and on top of the wing spanwise towards the root
b) air flows under the wing spanwise towards the root and on top of the wing spanwise towards the tip
c) Neither a) or b) since induced drag does not cause spanwise flow

6. What is absolute humidity?

a) The temperature to which humid air must be cooled at constant pressure to become saturated.
b) The actual amount of the water vapour in a mixture of air and water
c) The ratio of the water vapour actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure

7. Which atmospheric conditions will cause the true landing speed of an aircraft to be the greatest?
a) Low temperature with low humidity
b) High temperature with low humidity
c) High temperature with high humidity

8. If all, or a significant part of a stall strip is missing on an aeroplane wing, a likely result will be
a) increased lift in the area of installation on the opposite wing at high angles of attack
b) asymmetrical aileron control at low angles of attack

c)   asymmetrical aileron control at or near stall angles of attack

9.   When a leading edge slat opens, there is a gap between the slat and the wing. This is
a) to allow it to retract back into the wing
b) to allow air through to re-energize the boundary layer on top of the wing
c)   to keep the area of the wing the same

10.   An aeroplane wing is designed to produce lift resulting from relatively

a) positive air pressure below and above the wing's surface.
b) negative air pressure below the wing's surface and positive air pressure above the wing's surface.
c)   positive air pressure below the wing's surface and negative air pressure above the wing's surface
==
ans[1] = "c";
ans[2] = "b";
ans[3] = "b";
ans[4] = "b";
ans[5] = "a";
ans[6] = "c";
ans[7] = "c";
ans[8] = "c";
ans[9] = "b";
ans[10] = "c";

explain[1]="Absolute humidity is the 'actual' amount of water in a mixture of air and water.";
explain[2]="Vmd is where the induced drag curve intersects with the profile drag curve. Increasing the weight elevates the induced drag (lift dependant drag) and therefore the intersection is shifted to the right (greater Vmd).";
explain[3]="Temperature is a measure of the kinetic energy of the molecules of a substance. Heat is a form of energy exchange.";
explain[4]="Relative humidity is the ratio of the water vapour actually present to the water vapour that the air would hold if it were saturated.";
explain[5]="Induced drag causes air to flow under the wing spanwise towards the tip and on top of the wing spanwise towards the root.";
explain[6]="Relative humidity is the ratio of the water vapour actually present to the water vapour that the air would hold if it were saturated.";
explain[7]="High temperature and high humidity are the worst conditions for aircraft performance.";
explain[8]="The stall strip is to make the root of the wing stall before the tip so at the stall point, full aileron control is maintained.";
explain[9]="The gap which opens up when the leading edge slat opens is to allow high pressure through from beneath the wing and re-energise the boundary layer on top of the wing.";
explain[10]="The wing is designed to produce lift resulting from relatively positive air pressure below the wing surface and negative air pressure above the wing surface.";

==

Exam Number:-27.

----

1. Aspect ratio of a wing is defined as the ratio of the

a) wingspan to the wing root
b) square of the chord to the wingspan
c) wingspan to the mean chord

2. Which of the following is true?

a) Lift acts at right angles to the wing chord line and weight acts vertically down
b) Lift acts at right angles to the relative airflow and weight acts vertically down
c) Lift acts at right angles to the relative air flow and weight acts at right angles to the aircraft centre line

3. The temperature to which humid air must be cooled at constant pressure to become saturated is called

a) dewpoint
b) absolute humidity
c) relative humidity

4. The airflow over the upper surface of a cambered wing

a) increases in velocity and pressure
b) increases in velocity and reduces in pressure
c) reduces in velocity and increases in pressure

5. Which type of flap increases the area of the wing?

a) Plain Flap
b) Fowler Flap
c) All flaps

6. If all, or a significant part of a stall strip is missing on an aeroplane wing, a likely result will be

a) increased lift in the area of installation on the opposite wing at high angles of attack
b) asymmetrical aileron control at low angles of attack
c) asymmetrical aileron control at or near stall angles of attack

7. With increased speed in level flight

a) induced drag increases
b) profile drag increases
c) profile drag remains constant

8. Deployment of flaps will result in

a) a decrease in stall angle
b) an increase in stall angle

c)   a decrease in angle of attack

9.   An aeroplane wing is designed to produce lift resulting from relatively
a) positive air pressure below and above the wing's surface.
b) negative air pressure below the wing's surface and positive air pressure above the wing's surface.
c)   positive air pressure below the wing's surface and negative air pressure above the wing's surface.

10.   The angle of attack of an aerofoil section is the angle between the

a) chord line and the relative airflow
b) underside of the wing surface and the mean airflow
c)   chord line and the centre line of the fuselage
==
ans[1] = "c";
ans[2] = "b";
ans[3] = "a";
ans[4] = "b";
ans[5] = "b";
ans[6] = "c";
ans[7] = "b";
ans[8] = "a";
ans[9] = "c";
ans[10] = "a";

explain[1]="Aspect ratio is defined as the ratio of the wing span to mean chord.";
explain[2]="Lift acts at right angles to the relative airflow and weight acts vertically down.";
explain[3]="The temperature to which humid air must be cooled to become saturated is called the 'due point'.";
explain[4]="Airflow flowing over the upper surface of an aerofoil increases in velocity and decreases in pressure.";
explain[5]="A fowler flap increases the wing area as well as increasing the wing camber.";
explain[6]="The stall strip is to make the root of the wing stall before the tip so at the stall point, full aileron control is maintained.";
explain[7]="With increased speed in level flight, the profile drag increases and the induced drag decreases.";
explain[8]="Deployment of flaps increases camber and decreases stall angle.";
explain[9]="The wing is designed to produce lift resulting from relatively positive air pressure below the wing surface and negative air pressure above the wing surface.";
explain[10]="Angle of attack of an aerofoil is the angle between the chord line and the relative air flow.";

==

Exam Number:-28.

----

1.   A swept wing tends to stall first at the

a) root
b) tip
c)   centre section

2.   Kreuger Flaps are normally fitted to

a) the trailing edge of the wings
b) the tips of the wings
c)   the leading edge of the wings

3.   Aspect ratio of a wing is defined as the ratio of the

a) wingspan to the wing root.
b) square of the chord to the wingspan.
c)   wingspan to the mean chord

4.   The trailing vortex on a pointed wing (taper ratio = 0) is

a) at the root
b) at the tip
c)   equally all along the wing span

5.   A high wing aircraft will be more

a) laterally stable than a low wing aircraft
b) longitudinally stable than a low wing aircraft
c)   directionally stable than a low wing aircraft

6.   A wing with a very high aspect ratio (in comparison with a low aspect ratio wing) will have

a) increased drag at high angles of attack.
b) a low stall speed.
c)   poor control qualities at low airspeeds.

7.   The lift curve for a delta wing is

a) more steep than that of a high aspect ratio wing
b) less steep than that of a high aspect ratio wing
c)   the same as that of a high aspect ratio wing

8.   After an aircraft has been disturbed from its straight and level flight, it returns to its original attitude with a small amount of decreasing oscillation. The aircraft is

a) statically stable but dynamically unstable

b) statically unstable but dynamically stable

c) statically stable and dynamically stable

9. An increase in the speed at which an aerofoil passes through the air increases lift because
a) the increased speed of the airflow creates a greater pressure differential between the upper and lower surfaces.
b) the increased speed of the airflow creates a lesser pressure differential between the upper and lower surfaces.
c) the increased velocity of the relative wind increases the angle of attack

10. A delta wing has
a) a higher stall angle than a straight wing
b) a lower stall angle than a straight wing
c) the same stall angle than a straight wing
==
ans[1] = "b";
ans[2] = "c";
ans[3] = "c";
ans[4] = "c";
ans[5] = "a";
ans[6] = "a";
ans[7] = "b";
ans[8] = "c";
ans[9] = "a";
ans[10] = "a";

explain[1]="A swept wing tends to stall first at the tip.";
explain[2]="Kreuger Flaps are normally fitted to the leading edge of the wings (ref: 737-100,200 etc.).";
explain[3]="Aspect ratio is defined as the ratio of the wingspan to the mean chord.";
explain[4]="Trailing vortex of a pointed wing is spread equally along the trailing edge.";
explain[5]="Due to pendulum effect of the fuselage, a high wing aircraft will be more laterally stable than a low wing aircraft.";
explain[6]="A very high aspect ratio wing will have increased drag at high angles of attack.";
explain[7]="A delta wing produces less lift for any given angle of attack than any other type of wing.";
explain[8]="Static stability is the ability of the aircraft to return to its untrimmed position. Dynamic stability is the ability of the aircraft to not oscillate about the trimmed position.";
explain[9]="Increasing the speed of an aerofoil increases the pressure differential between the upper and lower surface.";
explain[10]="A delta wing has a much higher stall angle than a normal wing.";

==

Exam Number:-29.

----

1.   The Lift/Drag ratio of a wing at the stalling angle is

a) of a negative value
b) low
c)   high

2.   The airflow over the upper surface of a cambered wing
a) increases in velocity and pressure
b) increases in velocity and reduces in pressure
c)   reduces in velocity and increases in pressure

3.   The speed of air over a swept wing which contributes to the lift is

a) less than the aircraft speed
b) more than the aircraft speed
c)   the same as the aircraft speed

4.   For a given angle of attack induced drag is

a) greater on a high aspect ratio wing
b) greater towards the wing root
c)   greater on a low aspect ratio wing

5.   In straight and level flight, the angle of attack of a swept wing is

a) the same as the aircraft angle to the horizontal
b) more than the aircraft angle to the horizontal
c)   less than the aircraft angle to the horizontal

6.   Induced drag

a) is never equal to the profile drag
b) is equal to the profile drag at the stalling speed
c)   is equal to the profile drag at Vmd

7.   A delta wing aircraft flying at the same speed (subsonic) and angle of attack as a swept wing aircraft of similar wing area will produce

a) the same lift
b) more lift
c)   less lift

8.   The stagnation point is

a) static pressure plus dynamic pressure
b) static pressure minus dynamic pressure

c)   dynamic pressure only

9.   On a swept wing aircraft, due to the adverse pressure gradient, the boundary layer on the upper surface of the wing tends to flow

a) directly from leading edge to trailing edge

b) towards the tip

c)   towards the root

10.   With increased speed in level flight

a) induced drag increases

b) profile drag increases

c)   profile drag remains constant

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ans[1] = "b";

ans[2] = "b";

ans[3] = "b";

ans[4] = "c";

ans[5] = "b";

ans[6] = "c";

ans[7] = "c";

ans[8] = "a";

ans[9] = "b";

ans[10] = "b";

explain[1]="At stall the lift drops rapidly and the drag increases rapidly. Lift/Drag ratio therefore decreases.";

explain[2]="Airflow over the upper surface of a cambered surface of the wing increases in velocity and decreases in pressure.";

explain[3]="Airflow over the upper surface of a cambered surface of the wing has a greater velocity than the aircraft speed.";

explain[4]="A low aspect ratio wing (short-stubby wing) has a greater induced drag.";

explain[5]="Angle of attack in straight and level flight is equal toi the angle of incidence which is more than the angle of the aircraft (swept wing or not).";

explain[6]="Induced drag is equal to profile drag at Vmd.";

explain[7]="A delta wing aircraft at any given angle of attack and speed will produce less lift than any other type of wing.";

explain[8]="At stagnation, the pressure is total (static plus dynamic).";

explain[9]="Due to adverse pressure gradient on a swept wing, the boundary layer slides towards the tip and thickens at the tip.";

explain[10]="Profile drag increases with speed, induced drag decreases with speed.";

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Exam Number:-30.

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1.   If a swept wing stalls at the tips first, the aircraft will

a) pitch nose up

b) pitch nose down

c)   roll

2.   The thickness/chord ratio of the wing is also known as

a) aspect ratio
b) mean chord ratio
c)   fineness ratio

3.   Flexure of a rearward swept wing will

a) increase the lift and hence increase the flexure
b) decrease the lift and hence decrease the flexure
c)   increase the lift and hence decrease the flexure

4.   A High Aspect Ratio wing is a wing with

a) long span, long chord
b) long span, short chord
c)   short span, long chord

5.   Stall commencing at the root is preferred because

a) the ailerons become ineffective
b) it provides the pilot with a warning of complete loss of lift
c)   it will cause the aircraft to pitch nose up

6.   An aircraft flying in "ground effect" will produce

a) more lift than a similar aircraft outside of ground effect
b) less lift than a similar aircraft outside of ground effect
c)   the same lift as a similar aircraft outside of ground effect

7.   If the angle of attack of a wing is increased in flight, the

a) C of P will move forward
b) C of G will move aft
c)   C of P will move aft

8.   The Rams Horn Vortex on a forward swept wing will be

a) the same as a rearward swept wing
b) more than a rearward swept wing
c)   less than a rearward swept wing

9.   When maintaining level flight an increase in speed will

a) cause the C of P to move aft
b) cause the C of P to move forward
c)   have no affect on the position of the C of P

10.   For a cambered wing section the zero lift angle of attack will be

a) zero
b) 4 degrees
c)   negative
==
ans[1] = "a";
ans[2] = "c";
ans[3] = "b";
ans[4] = "b";
ans[5] = "b";
ans[6] = "a";
ans[7] = "a";
ans[8] = "c";
ans[9] = "c";
ans[10] = "c";

explain[1]="Since the tips are behind the Centre of Gravity, losing the lift at the tips will cause the nose to rise.";
explain[2]="The thickness/chord ratio of the wing is also known as the fineness ratio.";
explain[3]="Flexure of a rearward swept wing will decrease the lift (since the wing presents its upper surface to the airflow and the angle of attack reduces) and so the wing flexes back.";
explain[4]="Aspect ratio is the ratio of span to chord";
explain[5]="Stall commencing at the root causes turbulent air to hit the tailplane. The resulting 'buffet' warns the pilot just before complete stall.";
explain[6]="An aircraft flying in ground effect will have more lift than an aircraft not flying in ground effect (which is why seagulls glide close to the water surface).";
explain[7]="Increasing the angle of attack moves the CofP foreward.";
explain[8]="A forward swept wing does not suffer from the Rams Horn Vortex.";
explain[9]="A change in speed has no effect on the position of the CofP (providing angle of attack is not changed).";
explain[10]="A non symmetrical wing will produce some lift at zero degrees. Therefore it must have a negative angle of attack to produce zero lift.";

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