Module 8 Exam Practice Exam
Module 8 Aerodynamics

This is exam number 1.

1. On a swept wing aircraft if both wing tip sections lose lift simultaneously the aircraft will
a) roll
b)pitch nose up
c) pitch nose down
Answer:B

2. Lift on a delta wing aircraft
a) increases with an increased angle of incidence (angle of attack)
b)decreases with an increase in angle of incidence (angle of attack)
c) does not change with a change in angle of incidence (angle of attack)
Answer:A

3. On a straight wing aircraft, stall commences at the
a) root on a high thickness ratio wing
b)tip on a high thickness ratio wing
c) tip on a low thickness ratio wing
Answer:A

4. On a high wing aircraft in a turn
a) the up-going wing loses lift causing a de-stabilising effect
b)the down-going wing gains lift causing a stabilising effect
c) the down-going wing loses lift causing a de-stabilising effect

Answer:B

5. For the same angle of attack, the lift on a delta wing
a) is greater than the lift on a high aspect ratio wing
b)is lower than the lift on a high aspect ratio wing
c) is the same as the lift on a high aspect ratio wing
Answer:B

6. The ISA
a) is taken from the equator
b)is taken from 45 degrees latitude
c) assumes a standard day
Answer:B

7. At higher altitudes as altitude increases, pressure
a) decreases at constant rate
b)increases exponentially
c) decreases exponentially
Answer:C

8. The thrust-drag couple overcomes the lift-weight couple. What direction of force is required to be produced by the tail of the aircraft to maintain straight and level flight
a) upwards
b)downwards
c) sideways
Answer:A

9. When the pressure is half of that at sea level, what is the altitude?
a) 12,000 ft
b)8,000 ft
c) 18,000 ft
Answer:C

10. During a turn, the stalling angle

a) increases
b)decreases
c) remains the same
Answer:C

This is exam number 2.

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1. If gauge pressure on a standard day at sea level is 25 PSI, the absolute pressure is
a) 10.3 PSI
b)43.8 PSI
c) 39.7 PSI
Answer:C

2. The C of G moves in flight. The most likely cause of this is
a) movement of passengers
b)movement of the centre of pressure
c) consumption of fuel and oils
Answer:C

3. The Cof P is the point where
a) all the forces on an aircraft act
b)the three axis of rotation meet
c) the lift can be said to act

Answer:C

4. The three axis of an aircraft act through the
a) C of G
b)C of P
c) stagnation point
Answer:A

5. Pressure decreases
a) proportionally with a decreases in temperature
b)inversely proportional to temperature
c) Pressure and temperature are not related
Answer:A

6. As air gets colder, the service ceiling of an aircraft
a) reduces
b)increases
c) remains the same
Answer:B

7. What is sea level pressure?
a) 1013.2 mb
b)1012.3 mb
c) 1032.2 mb
Answer:A

8. When the weight of an aircraft increases, the minimum drag speed
a) decreases
b)increases
c) remains the same
Answer:B

9. An aircraft will have
a) less gliding distance if it has more payload
b)more gliding distance if it has more payload
c) the same gliding distance if it has more payload
Answer:C

10. 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 caused by spanwise flow
Answer:A

This is exam number 3.

1. At stall, the wingtip stagnation point
a) moves toward the lower surface of the wing
b)moves toward the upper surface of the wing
c) doesn't move
Answer:A

2. How does IAS at the point of stall vary with height?
a) It is practically constant

b)It increases
c) It decreases
Answer:A

3. The rigging angle of incidence of an elevator is
a) the angle between the mean chord line and the horizontal in the rigging position
b)the angle between the bottom surface of the elevator and the horizontal in the rigging position
c) the angle between the bottom surface of the elevator and the longitudinal datum
Answer:A

4. What is the lapse rate with regard to temperature?
a) 1.98oC per 1000 ft

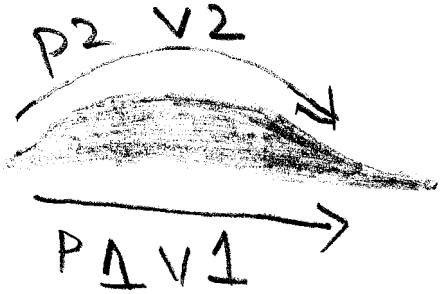
b)1.98oF per 1000 ft
c) 4oC per 1000 ft
Answer:A

5. What happens to load factor as you decrease turn radius?
a) It increases
b)It decreases
c) It remains constant
Answer:A

6. If you steepen the angle of a banked turn without increasing airspeed or angle of attack, what will the aircraft do?
a) It will remain at the same height
b)It will sideslip with attendant loss of height
c) It will stall
Answer:B

7. An aircraft wing tends to stall first at
a) the tip due to a higher ratio thickness/chord
b)the tip due to a lower ratio thickness/chord
c) the root due to a higher ratio thickness/chord
Answer:C

8. Dihedral wings combat instability in



in
a) pitch
b)yaw
c) sideslip

Answer:C

9. To stop aircraft decreasing in height during a sideslip, the pilot can
a) advance the throttle
b)pull back on the control column
c) adjust the rudder position
Answer:A

10. What control surface movements will make an aircraft fitted with ruddervators yaw to the left?
a) Left ruddervator lowered, right ruddervator raised
b)Right ruddervator lowered, left ruddervator raised
c) Both ruddervators raised
Answer:A

This is exam number 4.

1. 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
Answer:B

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
Answer:B

3. If the wing tips stall before the root on a swept wing aircraft, the aircraft will
a) roll
b)pitch nose up
c) pitch nose down
Answer:B

4. Lift on a delta wing aircraft
a) increases with an increased angle of incidence (angle of attack)
b)decreases with an increase in angle of incidence (angle of attack)
c) does not change with a change in angle of incidence (angle of attack)
Answer:A

5. On a straight wing aircraft, stall commences at the
a) root on a high thickness ratio wing
b)tip on a high thickness ratio wing
c) tip on a low thickness ratio wing
Answer:A

6. On a high wing aircraft in a turn
a) the up-going wing loses lift causing 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
Answer:B

7. For the same angle of attack, the lift on a delta wing
a) is greater than the lift on a high aspect ratio wing
b)is lower than the lift on a high aspect ratio wing
c) is the same as the lift on a high aspect ratio wing
Answer:B

8. Standard sea level temperature is
a) 0 degrees Celsius
b)15 degrees Celsius
c) 20 degrees Celsius
Answer:B

9. As altitude increases, pressure
a) decreases at constant rate
b)increases exponentially
c) decreases exponentially
Answer:C

10. The thrust-drag couple overcomes the lift-weight couple. What direction of force is required to be produced by the tail of the aircraft to maintain straight and level flight?
a) Upwards
b)Downwards
c) Sideways
Answer:A

This is exam number 5.

1. Lapse rate usually refers to
a) Pressure
b)Density
c) Temperature
Answer:C

2. During a turn, the stalling angle
a) increases
b)decreases
c) remains the same

Answer:C

3. The vertical fin of a single engined aircraft is
a) parallel with both the longitudinal axis and vertical axis
b)parallel with the longitudinal axis but not the vertical axis
c) parallel with the vertical axis but not the longitudinal axis
Answer:C

4. Aircraft flying in the transonic range most often utilize
a) sweptback wings
b)advanced supercritical airfoils
c) high wings
Answer:A

5. Which type of flap changes the area of the wing?
a) Fowler
b)Split
c) Slotted
Answer:A

6. Forward swept wings tend to stall at the root first so the aircraft retains lateral control, so why are they never used on passenger aircraft?
a) Because the wing tips wash in at high wing loads
b)Because the wing tips wash out at high wing loads
c) Because at high loads their angle of incidence increases and the loads imposed on the wing can increase until they destroy it
Answer:C

7. What happens to air flowing at the speed of sound when it enters a converging duct?
a) Velocity decreases, pressure and density increase
b)Velocity increases, pressure and density decreases
c) Velocity, pressure and density increase
Answer:A

8. As the angle of attack of an airfoil increases the centre of pressure
a) moves forward
b)moves aft
c) remains stationary

Answer:A
9. An aircraft, which is longitudinally stable, will tend to return to level flight after a movement about which axis?
a) Pitch
b)Roll
c) Yaw
Answer:A

10. Vapour trails from the wingtips of an aircraft in flight are caused by
a) low pressure above the wing and high pressure below the wing causing vortices
b)high pressure above the wing and low pressure below the wing causing vortices
c) low pressure above the wing and high pressure below the wing causing a temperature rise
Answer:A

This is exam number 6.

1. Vortex generators on the wing are most effective at
a) high speed
b)low speed
c) high angles of attack
Answer:C

2. The chord line of a wing is a line that runs from
a) the centre of the leading edge of the wing to the trailing edge
b)half way between the upper and lower surface of the wing
c) one wing tip to the other wing tip
Answer:A

3. The angle of incidence of a wing is an angle formed by lines
a) parallel to the chord line and longitudinal axis
b)parallel to the chord line and the lateral axis
c) parallel to the chord line and the vertical axis
Answer:A

4. The centre of pressure of an aerofoil is located
a) 30 - 40% of the chord line back from the leading edge
b)30 - 40% of the chord line forward of the leading edge
c) 50% of the chord line back from the leading edge
Answer:A

5. Compressibility effect is
a) drag associated with the form of an aircraft
b)drag associated with the friction of the air over the surface of the aircraft
c) the increase in total drag of an aerofoil in transonic flight due to the formation of shock waves
Answer:C

6. Lateral control of an aircraft at high angle of attack can be maximised by using
a) fences
b)vortex generators
c) wing slots
Answer:B

7. Stall strips are always
a) made of metal

b)on the leading edge of a wing
c) fitted forward of the ailerons
Answer:B

8. Stall strips
a) cause the wing root to stall
b)cause the wing tip to stall
c) cause the wings to stall symmetrically
Answer:A

9. Due to the interference of the airflow on a high wing aircraft between the fuselage and the wings, the lateral stability of the aircraft in a gusty wind situation will cause
a) the upper wing to increase its lift
b)the upper wing to decrease its lift
c) the lower wing to decrease its lift
Answer:B

10. Slats
a) reduce the stall speed
b)reduce the tendency of the aircraft to Yaw
c) decrease the aerofoil drag at high speeds
Answer:A

This is exam number 7.

1. A high aspect ratio wing will give
a) high profile and low induced drag
b)low profile and high induced drag
c) low profile and low induced drag
Answer:C

2. Aerofoil efficiency is defined by
a) lift over drag

b)drag over lift
c) lift over weight

Answer:A

3. An aircraft banks into a turn. No change is made to the airspeed or angle of attack. What will happen?
a) The aircraft enters a side slip and begins to lose altitude
b)The aircraft turns with no loss of height
c) The aircraft yaws and slows down
Answer:A

4. The relationship between induced drag and airspeed is, induced drag is
a) directly proportional to the square of the speed
b)inversely proportional to the square of the speed
c) directly proportional to speed
Answer:B

5. What is the definition of Angle of Incidence?
a) The angle the underside of the mainplane or tailplane makes with the horizontal
b)The angle the underside of the mainplane or tailplane makes with the longitudinal datum line
c) The angle the chord of the mainplane or tailplane makes with the horizontal
Answer:C

6. What is Boundary Layer?
a) Separated layer of air forming a boundary at the leading edge
b)Turbulent air moving from the leading edge to trailing edge
c) Sluggish low energy air that sticks to the wing surface and gradually gets faster until it joins the free stream flow of air
Answer:C

7. The normal axis of an aircraft passes through

a) the centre of gravity
b)a point at the centre of the wings
c) at the centre of pressure
Answer:A

8. On a high winged aircraft, what effect will the fuselage have on the up-going wing?
a) The up-going wing will have a decrease in angle of attack and therefore a decrease in lift
b)The down-going will have a decrease in angle of attack and therefore a decrease in lift
c) The up-going wing will have an increase in angle of attack and therefore a decrease in lift
Answer:A

9. What is the collective term for the fin and rudder and other surfaces aft of the centre of gravity that helps directional stability?
a) Effective keel surface
b)Empennage
c) Fuselage surfaces
Answer:A

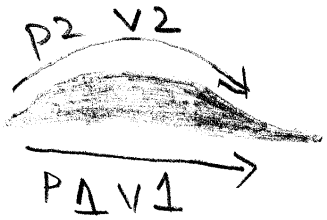
10. Temperature above 36,000 feet will
a) decrease exponentially
b)remain constant
c) increase exponentially
Answer:B

This is exam number 8.

1. A decrease in incidence toward the wing tip may be provided to
a) prevent adverse yaw in a turn
b)prevent spanwise flow in maneuvers
c) retain lateral control effectiveness at high angles of attack
Answer:C

2. The angle of attack which gives the best L/D ratio
a) decreases with a decrease in density
b)in unaffected by density changes
c) increases with a decrease in density
Answer:B

3. For a given aerofoil production lift, where
P = pressure and V = velocity:



a) P1 is greater than P2, and V1 is greater than V2
b)P1 is less than P2 and V1 is greater than V2
c) P1 is greater than P2, and V1 is less than V2
Answer:C

4. Low wing loading
a) increases stalling speed, landing speed and landing run
b)increases lift, stalling speed and maneuverability
c) decreases stalling speed, landing speed and landing run
Answer:C

5. Due to the change in downwash on an untapered wing (i.e. one of constant chord length) it will
a) not provide any damping effect when rolling
b)tend to stall first at the root
c) not suffer adverse yaw effects when turning
Answer:B

6. True stalling speed of an aircraft increases with altitude

a) because reduced temperature causes compressibility effect
b)because air density is reduced
c) because humidity is increased and this increases drag
Answer:B

7. As a general rule, if the aerodynamic angle of incidence (angle of attack) of an aerofoil is slightly increased, the centre of pressure will
a) never move
b)move forward towards the leading edge
c) move towards the tip
Answer:B

8. The "wing setting angle" is commonly known as
a) angle of incidence
b)angle of attack
c) angle of dihedral
Answer:A

9. On a very humid day, an aircraft taking off would require
a) a shorter take off run
b)a longer take off run
c) humidity does not affect the take off run
Answer:B

10. An aircraft is flying at 350 MPH, into a head wind of 75 MPH, what will its ground speed be?
a) 175 mph
b)275 mph
c) 200 mph
Answer:B

This is exam number 9.

1. When does the angle of incidence change?
a) When the aircraft attitude changes
b)When the aircraft is ascending or descending

Answer:C

2. As the angle of attack decreases, what happens to the centre of pressure?
a) It moves forward
b)It moves rearwards
c) Centre of pressure is not affected by angle of attack decrease
Answer:B

3. A decrease in pressure over the upper surface of a wing or aerofoil is responsible for
a) approximately 2/3 (two thirds) of the lift obtained
b)approximately 1/3 (one third) of the lift obtained
c) approximately 1/2 (one half) of the lift obtained
Answer:A

4. Which of the four forces act on an aircraft?
a) Lift, gravity, thrust and drag
b)Weight, gravity, thrust and drag
c) Lift, weight, gravity and drag
Answer:A

5. Which of the following types of drag increases as the aircraft gains altitude?
a) Parasite drag
b)Induced drag
c) Interference drag
Answer:B

6. Correcting for a disturbance which has caused a rolling motion about the longitudinal axis would re-establish which of the following?
a) Lateral stability
b)Directional stability
c) Longitudinal stability
Answer:A

7. The layer of air over the surface of an aerofoil which is slower moving, in relation to the rest of the airflow, is known as
a) camber layer
b)boundary layer
c) none of the above
Answer:B

8. What is a controlling factor of turbulence and skin friction?
a) Aspect ratio
b)Fineness ratio
c) Counter sunk rivets used on skin exterior
Answer:C

9. Changes in aircraft weight
a) will not affect total drag since it is dependant only upon speed
b)cause corresponding changes in total drag due to the associated lift change
c) will only affect total drag if the lift is kept constant
Answer:B

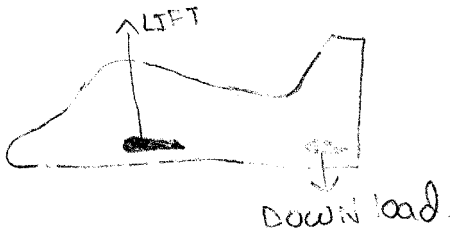
10. The aircraft stalling speed will
a) increase with an increase in weight
b)be unaffected by aircraft weight changes since it is dependant upon the angle of attack
c) only change if the MTMA were changed

Answer:A

This is exam number 10.

1. In a bank and turn
a) extra lift is not required
b)extra lift is not required if thrust is increased
c) extra lift is required
Answer:C

2. To maintain straight and level flight on the aeroplane shown, with a decrease in tail-plane download the mainplane lift would have to
(press F5 if the diagram does not show)



a) remain constant
b)decrease
c) increase
Answer:B

3. To achieve the maximum distance in a glide, the recommended air speed
is
a) as close to the stall as practical
b)as high as possible with VNE
c) the speed where the L/D ratio is maximum
Answer:C

4. If the C of G is aft of the Centre of Pressure
a) changes in lift produce a pitching moment which acts to increase the

change in lift
b)when the aircraft sideslips, the C of G causes the nose to turn into the sideslip thus applying a restoring moment
c) when the aircraft yaws the aerodynamic forces acting forward of the Centre of Pressure
Answer:A

5. Porpoising is an oscillatory motion in the
a) pitch plane
b)roll plane
c) yaw plane
Answer:A

6. Directional stability is maintained
a) by the mainplanes, and controlled by the ailerons
b)by the tailplane, and controlled by the elevators
c) by the keel surface and fin, and controlled by the rudder
Answer:C

7. Due to the interference effects of the fuselage, when a high wing aeroplane sideslips
a) the accompanying rolling due to keel surface area is destabilizing
b)the accompanying lift changes on the wings produces a stabilizing effect
c) the accompanying rolling due to the fin is destabilizing
Answer:B

8. The power required in a horizontal turn
a) is greater than that for level flight at the same airspeed
b)must be the same as that for level flight at the same airspeed
c) is less than that for level flight at the same airspeed
Answer:A

9. A wing mounted stall sensing device is located
a) usually on the under surface

b)always at the wing tip
c) always on the top surface
Answer:A

10. For an aircraft in a glide
a) thrust, drag, lift and weight act on the aircraft
b)weight, lift and drag act on the aircraft
c) weight and drag only act on the aircraft
Answer:B

This is exam number 11.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	A	C	C	A	B	B	B	A	B

1. The upper part of the wing in comparison to the lower
a) develops more lift
b)develops the same lift
c) develops less lift

2. What effect would a forward CG have on an aircraft on landing?
a) Increase stalling speed
b)No effect on landing
c) Reduce stalling speed

3. QNH refers to
a) quite near horizon
b)setting the altimeter to zero
c) setting the mean sea level atmospheric pressure so an altimeter

reads the aerodrome altitude above mean sea level

4. QNE refers to
a) Setting an altimeter to read aerodrome altitude above sea level
b)quite new equipment
c) setting the mean sea level atmospheric pressure in accordance with ICAO standard atmosphere i.e. 1013 millibars

5. An aspect ratio of 8 would mean
a) span 64, mean chord 8
b)mean chord 64 , span 8
c) span squared 64 ,chord 8

6. If an aircraft in level flight loses engine power it will
a) pitch nose up

b)pitch nose down
c) not change pitch without drag increasing

7. QFE is
a) sea level pressure
b)airfield pressure
c) difference between sea level and airfield pressure

8. The lift /drag ratio at stall
a) increases
b)decreases
c) is unchanged

9. On a straight unswept wing, stall occurs at
a) the thick portion, at the wing root
b)the thick portion, at the wing tip
c) the thin portion, at the wing tip

10. During a climb from a dive
a) the thrust required is greater than required for level flight
b)the thrust required is lower than for level flight
c) the thrust required is the same as for level flight

This is exam number 12.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	A	B	A	C	B	C	B	B	C

1. When power is off, the aircraft will pitch
a) nose down
b)nose up
c) trim level

2. Angle of attack on a down going wing in a roll
a) increases
b)decreases
c) unaffected

3. For any given speed, a decrease in aircraft weight, the induced drag will
a) increase
b)decrease
c) remain the same

4. The amount of lift generated by a wing is
a) greatest at the root
b)greatest at the tip
c) constant along the span

5. Induced Drag is
a) greatest towards the wing root and downwash is greatest at the tip
b)greatest towards the wing tip and downwash is greatest towards the root
c) greatest towards the tip and downwash decreases from tip to root

6. Induced Drag is
a) equal to profile drag at stalling angle
b)equal to profile drag at Vmd
c) never equal to profile drag

7. With an increase in aircraft weight
a) Vmd will be at the same speed
b)Vmd will be at a lower speed
c) Vmd will be at a higher speed

8. For a given IAS an increase in altitude will result in
a) no change in the value of induced drag
b)an increase in induced drag
c) an increase in profile drag

9. As the angle of attack of a wing is increased in level flight
a) the Cof G moves aft and the Cof P forward
b)the Cof P and transition point move forward

c) the Cof P moves forward and the stagnation point aft over the upper surface

10. Stall inducers may be fitted to a wing
a) at the tip to cause the root to stall first
b)at the root to cause the tip to stall first
c) at the root to cause the root to stall first

This is exam number 13.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	**A**	**A**	**C**	**B**	**B**	**A**	**B**	**C**	**B**

1. With increasing altitude pressure decreases and
a) temperature decreases at the same rate as pressure reduces
b)temperature decreases but at a lower rate than pressure reduces
c) temperature remains constant to 8000 ft

2. The Centre of Pressure is
a) the point on the chord line at which the resultant lift force may be said to act
b)the point of maximum pressure on the under surface of the wing
c) the centre of gravity of the wing

3. If the angle of attack is increased the Centre of Pressure will
a) move forward
b)move rearward
c) remain stationary

4. The optimum angle of attack of an aerofoil is the angle at which
a) the aerofoil produces maximum lift
b)the aerofoil produces zero lift
c) the highest lift/drag ratio is produced

5. A high aspect ratio wing has a
a) increased induced drag
b)decreased induced drag
c) decreased skin friction drag

6. Minimum total drag of an aircraft occurs
a) at the stalling speed
b)when profile drag equals induced drag
c) when induced drag is least

7. If the weight of an aircraft is increased, the induced drag at a given speed
a) will increase
b)will decrease
c) will remain the same

8. The transition point on a wing is the point where
a) the flow separates from the wing surface
b)the boundary layer flow changes from laminar to turbulent
c) the flow divides to pass above and below the wing

9. The boundary layer of a body in a moving airstream is
a) a thin layer of air over the surface where the air is stationary
b)a layer of separated flow where the air is turbulent
c) a layer of air over the surface where the airspeed is changing from

free stream speed to zero speed

10. A laminar boundary layer will produce
a) more skin friction drag than a turbulent one
b)less skin friction drag than a turbulent one
c) the same skin friction drag as a turbulent one

This is exam number 14.
ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	**B**	**B**	**A**	**A**	**A**	**C**	**C**	**B**	**B**

1. Longitudinal stability is given by
a) the fin
b)the wing dihedral
c) the horizontal tailplane

2. Lateral stability is given by
a) the ailerons
b)the wing dihedral
c) the horizontal tailplane

3. Stability about the lateral axis is given by
a) wing dihedral
b)the horizontal tailplane
c) the ailerons

4. Sweepback of the wings will

a) increase lateral stability
b)decrease lateral stability
c) not affect the lateral stability

5. Dutch Roll is
a) a combined rolling and yawing motion
b)a type of slow roll
c) primarily a pitching instability

6. A high wing position gives
a) more lateral stability than a low wing
b)less lateral stability than a low wing
c) the same lateral stability as a low wing

7. On an aircraft in an unpowered steady speed descent
a) the lift equals the weight
b)the weight equals the drag
c) the weight equals the resultant of the lift and drag

8. When an aircraft rolls to enter a turn and power is not increased
a) the lift equals the weight
b)the lift is greater than the weight
c) the lift is less than the weight

9. The boundary layer is
a) thickest at the leading edge
b)thickest at the trailing edge
c) constant thickness from leading to trailing edges

10. The amount of thrust produced by a jet engine or a propeller can be calculated using
a) Newton's 1st law
b)Newton's 2nd law
c) Newton's 3rd law

This is exam number 15.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	**C**	**C**	**A**	**C**	**A**	**A**	**A**	**B**	**C**

1. An engine which produces an efflux of high speed will be
a) more efficient
b)less efficient
c) speed of efflux has no affect on the engine efficiency

2. When an aircraft with a Cof G forward of the Cof P rolls, the nose of the aircraft will
a) stay level
b)rise
c) drop

3. Directional stability may be increased with
a) pitch dampers
b)horn balance
c) yaw dampers

4. Lateral stability may be increased with

a) increased lateral dihedral
b)increased lateral anhedral
c) increased longitudinal dihedral

5. Longitudinal stability is increased if the
a) CP moves forward of the CG
b)Thrust acts on a line below the total drag
c) CG is forward of the CP

6. Wing loading is calculated by weight
a) divided by gross wing area
b)divided by lift
c) multiplied by gross wing area

7. Induced drag is
a) inversely proportional to the square of speed
b)proportional to speed
c) nothing to do with speed

8. In a bank, the weight is
a) increased
b)decreased
c) the same

9. L/D ratio is
a) higher at supersonic cruise speed
b)higher at sub sonic speed
c) the same

10. The power required at low altitude for a given IAS is
a) the same as at high altitude
b)higher
c) lower

This is exam number 16.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	**B**	**C**	**A**	**C**	**C**	**B**	**A**	**A**	**A**

1. If the stall speed is 75 knots. What is the same stall speed in mph?
a) 75 x 0.87
b)75 / 0.87
c) 75 / 0.87 x relative density

2. As the angle of attack increases the stagnation point
a) moves towards the upper surface
b)moves towards the lower surface
c) does not move

3. The term pitch-up is due to
a) compressibility effect
b)ground effect
c) longitudinal instability

4. In a steady climb at a steady IAS, the TAS is
a) more than IAS
b)less than IAS
c) the same

5. An untapered straight wing will
a) have no yaw effect in banking
b)have no change in induced drag in the bank
c) stall at the root first

6. With the ailerons away from the neutral, induced drag is
a) unchanged but profile drag is higher
b)higher on the lower wing plus profile drag increases
c) higher on the upper wing plus profile drag increases

7. The lift/drag ratio is
a) higher at mach numbers above supersonic
b)higher at sub sonic mach numbers
c) the same

8. The force opposing thrust is
a) drag
b)lift
c) Weight

9. Directional stability is about the
a) normal axis
b)longitudinal axis
c) lateral axis

10. Lateral stability is about the
a) longitudinal axis
b)normal axis

c) vertical axis

This is exam number 17.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	**A**	**B**	**A**	**B**	**A**	**C**	**C**	**B**	**B**

1. All the lift can be said to act through the
a) centre of pressure
b)centre of gravity
c) normal axis

2. Longitudinal stability is provided by the
a) horizontal stabilizer
b)vertical stabilizer
c) mainplane

3. The concept of thrust is explained by
a) Newton’s 1st law
b)Newton’s 3rd law
c) Bernoulli’s theorem

4. The camber of an aerofoil section is
a) the curvature of the median line of the aerofoil
b)the angle of incidence towards the tip of a wing
c) the angle which the aerofoil makes with the relative airflow

5. If the aircraft turns and side-slips

a) the sweepback of the wing will correct the sideslip
b)the dihedral of the wing will correct the sideslip
c) the keel surface will correct the sideslip

6. Movement of an aircraft about its lateral axis
a) is pitching
b)is rolling
c) is yawing

7. Induced drag
a) is caused by skin friction
b)results from disturbed airflow in the region of mainplane attachments
c) is associated with the lift generated by an aerofoil

8. What is the temperature in comparison to ISA conditions at 30,000ft?
a) - 60C
b)- 56C
c) - 45C

9. At what altitude is the tropopause?
a) 63,000 ft.
b)36,000 ft.
c) 57,000 ft.

10. What approximate percentage of oxygen is in the atmosphere?
a) 12%
b)21%
c) 78%

This is exam number 18.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	**C**	**C**	**C**	**A**	**C**	**B**	**A**	**B**	**B**

1. Which has the greater density?
a) Air at low altitude
b)Air at high altitude
c) It remains constant

2. As air flows over the upper cambered surface of an aerofoil, what happens to velocity and pressure?
a) Velocity decreases, pressure decreases
b)Velocity increases, pressure increases
c) Velocity increases, pressure decreases

3. What is the force that tends to pull an aircraft down towards the earth?
a) Drag
b)Thrust
c) Weight

4. Which of the following act in opposition to forward movement?
a) Lift
b)Gravity
c) Drag

5. The angle at which the chord line of the aerofoil is presented to the airflow is known as
a) angle of attack
b)angle of incidence
c) resultant

6. The imaginary straight line which passes through an aerofoil section from leading edge to trailing edge is called
a) centre of pressure
b)the direction of relative airflow
c) the chord line

7. What is the angle between the chord line of the wing, and the longitudinal axis of the aircraft, known as
a) angle of attack
b)angle of incidence
c) angle of dihedral

8. An aircraft disturbed from its normal flight path, and automatically returns to that normal flight path, without any action on the part of the pilot is known as
a) aircraft stability
b)aircraft instability
c) aircraft stall

9. Directional control is provided by
a) horizontal stabilizer
b)rudder
c) elevator

10. About which axis of the aircraft does a rolling motion take place?
a) Normal axis
b)Longitudinal axis
c) Lateral axis

This is exam number 19.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	**B**	**B**	**C**	**A**	**C**	**B**	**C**	**C**	**C**

1. Which motion happens about the lateral axis?
a) Pitching
b)Yawing
c) Rolling

2. Wing tip vortices create a type of drag known as
a) form drag
b)induced drag
c) profile drag

3. Which of the following describes the “Empennage”?
a) Nose section of an aircraft, including the cockpit
b)Tail section of the aircraft, including fin, rudder, tail plane and elevators
c) The wings, including the ailerons

4. At what altitude does stratosphere commence approximately?

a) Sea level
b)63,000 ft
c) 36,000 ft

5. When an aircraft is in straight and level unaccelerated flight, which of the following is correct?
a) Lift and weight are equal, and thrust and drag are equal
b)Lift greater than weight, and thrust greater than drag
c) Lift greater than weight, and thrust is less than drag

6. As the angle of attack is increased (up to the stall point), which of the following is correct?
a) Pressure difference between top and bottom of the wing increases
b)Lift increases
c) Both a) and b) are correct

7. The fin gives stability about which axis?
a) Lateral axis
b)Normal axis
c) Longitudinal axis

8. What is the horizontal movement of the nose of the aircraft called?
a) Rolling movement
b)Pitching movement
c) Yawing movement

9. What type of drag, depends on the smoothness of the body, and surface
area over which the air flows?
a) Parasite drag

b)Form drag
c) Skin friction drag

10. If the nose of the aircraft is rotated about its lateral axis, what is its directional movement?
a) Turning to the left or right
b)Rolling or banking to the left or right
c) Climbing or diving

This is exam number 20.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	C	B	B	B	A	C	A	C	B

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

This is exam number 21.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	A	B	A	A	A	A	B	A	C

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

This is exam number 22.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	B	C	C	A	C	A	A	C	C

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 capacity 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 IAS, 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

This is exam number 23.

ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	**A**	**C**	**B**	**B**	**B**	**A**	**C**	**C**	**B**

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

This is exam number 24.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	B	B	B	C	A	B	B	B	B

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. In a turn, if your centrifugal force is greater than the horizontal component of lift
a) you are slipping
b)you are skidding
c) you are in a coordinated turn

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

This is exam number 25.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	C	B	C	C	C	B	B	A	C

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. Given 2 wings, the first with a span of 12m and a chord of 2 m. The second has a span of 6m and a chord of 1m. How do their Aspect Ratios compare?
a) The first is higher
b)The second is higher
c) They are the same

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

This is exam number 26.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	B	B	A	A	B	A	C	B	C

1. In flight if your aircraft nose gets an upward gust of wind, what characteristic will have the greatest effect to counteract it?
a) Horizontal stabiliser and fuselage length
b)Wing Sweep
c) Position of the centre of pressure relative to the centre of gravity

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. To correct Dutch roll you must damp oscillation around
a) the vertical axis
b)the lateral axis
c) the longitudinal axis

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. If the load factor on an aircraft is 2, your stall speed is
a) increased
b)decreased
c) stays the same

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

This is exam number 27.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
C	B	A	B	B	C	B	A	C	A

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

This is exam number 28.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	**C**	**A**	**A**	**A**	**B**	**B**	**C**	**A**	**A**

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. Given an aircraft with positive dihedral in a left turn, what wing will have the bigger angle of attack?
a) Left
b)Right
c) Neither

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 high 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

This is exam number 29.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	B	A	C	C	C	C	A	B	B

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

This is exam number 30..

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	C	B	B	B	A	A	C	A	C

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

This is exam number 31.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	B	C	A	C	A	C	B	C	A

1. Density changes with altitude at a rate
a) of 2kg/m3 per 1000ft
b)which changes with altitude
c) which is constant until 11km

2. Airflow at subsonic speed is taken to be
a) compressible
b)incompressible
c) either a or b depending on altitude

3. Bernoulli's equation shows that
a) at constant velocity the kinetic energy of the air changes with a

change of height
b)with a change in speed at constant height both kinetic and potential energies change
c) with a change in velocity at constant height the static pressure will change

4. If fluid flow through a venturi is said to be incompressible, the speed of the flow increases at the throat to
a) maintain a constant volume flow rate
b)allow for a reduction in static pressure
c) allow for an increase in static pressure

5. To produce lift, an aerofoil must be
a) asymmetrical
b)symmetrical
c) either a or b above

6. Lift is dependent on
a) the area of the wing, the density of the fluid medium, and the square of the velocity
b)the net area of the wing ,the density of the fluid medium and the velocity
c) the frontal area of the wing, the density of the fluid medium and the velocity

7. The maximum lift/drag ratio of a wing occurs
a) at the angle of attack where the wing develops its maximum lift
b)during take off
c) at an angle below which the wing develops max lift

8. A wing develops 10,000N of lift at 100knots. Assuming the wing remains at the same angle of attack and remains at the same altitude, how much lift will it develop at 300knots?
a) 900,000 N
b)90,000 N
c) 30,000 N

9. The angle of attack is
a) related to angle of incidence
b)always kept below 15 degrees
c) not related to the angle of incidence

10. The difference between the mean camber line and the chord line of an aerofoil is
a) one is always straight and the other may be straight
b)neither are straight
c) they both may be curved

This is exam number 32.
ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	**C**	**B**	**A**	**C**	**C**	**A**	**B**	**C**	**C**

1. If the C of G is calculated after loading as within limits for take off
a) no further calculation is required
b)a further calculation is required prior to landing to allow for fuel and oil consumption
c) a further calculation is required prior to landing to allow for flap deployment

2. A stalled aerofoil has a lift/drag ratio
a) more than the lift/drag ratio prior to stall
b)zero
c) less than the lift/drag ratio prior to stall

3. At low forward speed
a) increased downwash reduces tailplane effectiveness
b)increased downwash increases tailplane effectiveness
c) excessive rudder movement may cause fin to stall

4. Helicopter rotor blades create lift by
a) creating low pressure above the blades
b)pushing the air down
c) working like a screw

5. On some modern aircraft a stall warning will automatically
a) increase thrust
b)extend outboard slats
c) cause a pitch nose down movement

6. above 65,800 ft temperature
a) remains constant up to 115,000ft
b)decreases by 1.98oC up to 115000ft
c) increases by 0.303oC up to 115000ft

7. At sea level, ISA atmospheric pressure is

a) 14.7 PSI
b)14.7 Kpa
c) 10 Bar

8. The spanwise component of the airflow is
a) greater at higher speeds
b)less at higher speeds
c) unaffected by speed

9. A wing fence
a) increases lateral control
b)acts as a lift dumping device
c) reduces spanwise flow on a swept wing thus reducing induced drag

10. The highest lift/drag ratio is greatest at
a) low altitudes
b)the point just before the stalling angle
c) the optimum angle of attack

This is exam number 33.
ANSWERS

1.	2	3	4	5	6	7	8	9	10
B	B	B	C	A	A	A	C	C	A

1. With all conditions remaining the same, if the aircraft speed is halved, by what factor is the lift reduced?
a) Half
b)By a factor of 4
c) Remains the same

2. The boundary layer over an aerofoil is
a) a layer of air close to the aerofoil that is stationary
b)a layer of air close to the aerofoil which is moving at a velocity less than free stream air
c) a layer of turbulent air close to the aerofoil which is moving at a velocity less than free stream air

3. On a swept wing aircraft, the fineness ratio of an aerofoil is
a) highest at the root
b)highest at the tip
c) equal throughout the span

4. IAS for a stall will
a) increase with altitude
b)decrease with altitude
c) roughly remain the same for all altitude

5. If the radius of a turn is reduced the load factor will
a) increase
b)decrease
c) remain the same

6. Streamlining will reduce
a) form drag
b)induced drag
c) skin friction drag

7. If an aircraft has a gross weight of 3000 kg and is then subjected to a total weight of 6000 kg the load factor will be

a) 2G
b)3G
c) 9G

8. A constant rate of climb is determined by
a) weight
b)wind speed
c) excess engine power

9. Ice formed on the leading edge will cause the aircraft to
a) stall at the same stall speed and AoA
b)stall at a lower speed
c) stall at a higher speed

10. With an aircraft in bank, the upper wing produces more drag. To compensate
a) the rudder is operated
b)when bank angle is achieved then the ailerons are operated in the opposite direction to cause the opposite effect
c) angle of attack is increased

This is exam number 34.

ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	**A**	**C**	**A**	**A**	**C**	**A**	**B**	**C**	**B**

1. If both wings lose lift the aircraft
a) pitches nose up
b)pitches nose down

c) glides on a horizontal plane

2. Under what conditions will an aircraft create best lift?
a) Cold dry day at 200 ft
b)Hot damp day at 1200 ft
c) Cold wet day at 1200 ft

3. If there is an increase of density, what effect would there be in aerodynamic dampening?
a) None
b)Decreased
c) Increased

4. As Mach number increases, what is the effect on boundary layer?
a) Becomes more turbulent
b)Becomes less turbulent
c) Decreases in thickness

5. When a slat is retracted it moves
a) towards the upper leading edge of the wing
b)towards the lower leading edge of the wing
c) towards the center of the leading edge of the wing

6. In a turn the up-going wing causes a
a) de-stabilising effect due to increased AoA
b)de-stabilising effect due to decreased AoA
c) stabilising effect due to decreased AoA

7. The stagnation point consists of

a) dynamic and static air pressure
b)static air pressure
c) dynamic air pressure

8. During a glide the following forces act on an aircraft
a) lift, weight, thrust
b)lift, drag, weight
c) lift and weight only

9. Yawing is a rotation around
a) the normal axis obtained by the elevator
b)the lateral axis obtained by the rudder
c) the normal axis obtained by the rudder

10. If an aileron is moved downward
a) the stalling angle of that wing is increased
b)the stalling angle of that wing is decreased
c) the stalling angle is not affected but the stalling speed is decreased

This is exam number 35.

ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	**B**	**A**	**C**	**A**	**B**	**C**	**A**	**B**	**B**

1. If the wing loading of an aircraft were reduced the stalling speed would
a) increase
b)decrease

c) not be affected

2. Density changes with altitude at a rate
a) of 2 kg/m3 per 1000ft
b)which changes with altitude
c) which is constant until 11000m

3. The lift on a wing is increased with
a) an increase in pressure
b)an increase in humidity
c) an increase in temperature

4. An aircraft entering a level turn will require more lift
a) only if there is an increase in speed
b)only if there is an increase in angle of attack
c) in all cases

5. Lateral stability is reduced by increasing
a) anhedral
b)dihedral
c) sweepback

6. Pulling the control column and rotating to the left causes
a) elevator down, left aileron down
b)elevator up, left aileron up
c) elevator down, left aileron up

7. Azimuth stability is dependent on
a) dihedral

b)tailplane
c) keel and fin

8. If the aircraft is slipping in turn
a) the bank angle is too great
b)the bank angle is too small
c) the nose of the aircraft is too low

9. In normal flight conditions, an increase in aircraft speed
a) causes the nose of the aircraft to drop
b)causes the nose of the aircraft to lift
c) the nose remains in the same position

10. An aircraft sideslips. What helps to restore the aircraft?
a) Fin gives rolling movement
b)Dihedral causes the aircraft to roll straight and the fin increases the yaw rate
c) Tailplane

This is exam number 36.
ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A	**A**	**C**	**B**	**C**	**A**	**B**	**A**	**A**	**A**

1. For an aircraft climbing at a constant IAS the Mach number will
a) increase
b)decrease
c) remain constant

2. The airflow behind a normal shockwave will
a) always be subsonic and in the same direction as the original airflow
b)always be supersonic and in the same direction as the original airflow
c) always be subsonic and deflected from the direction of the original airflow

3. Sweepback of the wings will
a) not affect lateral stability
b)increase lateral stability at high speeds only
c) increase lateral stability at all speeds

4. With the flaps lowered, the stalling speed will
a) increase
b)decrease
c) remain the same

5. When flying close to the stall speed a pilot applies left rudder the aircraft will
a) pitch nose up
b)roll to the left
c) stall the left wing

6. When an aircraft is in a bank, the upper wing produces more drag. To compensate
a) the rudder is operated
b)when bank angle is achieved then the ailerons are operated in the opposite direction to cause the opposite effect
c) angle of attack is increased (pitch up)

7. When flaps are down it will
a) increase AOA and increase slow speed stability
b)decrease AOA and decrease slow speed stability
c) the AOA remains the same on both wings

8. If you have an aircraft that is more laterally stable then directionally stable it will tend to:
a) skid
b)slip
c) bank

9. On a very hot day with ambient temperature higher than ISA, your pressure altitude is 20,000 ft. How much will the density altitude be?
a) greater than 20000ft
b)less than 20000ft
c) the same

10. The atmospheric zone where the temperature remains fairly constant is called the
a) Stratosphere
b)Troposphere
c) Ionosphere

This is exam number 37.
ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
B	**C**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**B**

1. Induced drag can be reduced by the use of

a) streamlining
b)high aspect ratio wings
c)fairings at junctions between fuselage and wings

2. Interference drag can be reduced by the use of
a) streamlining
b)high aspect ratio wings
c) fairings at junctions between fuselage and wings

3. A centre of gravity position close to it's aft limit will cause the aircraft to
a) pitch nose up and decrease it's longitudinal stability
b)pitch nose down and increase it's longitudinal stability
c) pitch nose up and increase it's longitudinal stability

4. The result of an aircraft flying into a rainstorm of super cooled rain droplets would be an accretion of
a) rime ice
b)hoar ice
c) glaze ice

5. Ice accretion on an aircraft in flight that is opaque, rough, with low shear strength is
a) rime ice
b)hoar ice
c) glaze ice

6. In a steady climb
a) thrust is greater than drag
b)thrust is equal to drag

c) thrust is less than drag

7. On a slender delta wing at low speed the life/drag ratio is
a) reduced
b)increased
c) constant

8. A high winged aircraft in a turn requires returning to level flight.
a) Lift must decrease on the upper wing
b)Lift must increase on the upper wing
c) Lift must decrease on the lower wing

9. What happens to the load factor as you decrease the turn radius?
a) Load factor increases
b)Load factor decreases
c) Load factor remains constant

10. A high wing aircraft in a banked turn increases it's angle of bank without increasing it's angle of attack. The aircraft will
a) side slip
b)side slip with a loss of altitude
c) come out of the turn early

This is exam number 38.
ANSWERS

1.	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A	**B**	**B**	**C**	**A**	**B**	**A**	**A**	**A**	**C**

1. If the ambient temperature at sea level decreases, the operational ceiling height of the aircraft
a) increases
b)decreases
c) stays the same

2. A sharply swept wing will promote
a) excessive lateral instability
b)excessive lateral stability
c) excessive longitudinal stability

3. Which control surfaces provide directional and pitch control?
a) Elevons
b)Ruddervators
c) Tailerons

4. Which control surfaces provide lateral control , also longitudinal control and stability?
a) Flapperons
b)Ruddervators
c) Tailerons

5. Name the four fundamentals involved in manoeuvring the aircraft.
a) Aircraft power, pitch, bank and trim
b)Straight and level flight, turn and climb and descent.
c) Take off, slow flight and stalls

6. Under the category system the design load factor for an airplane in the normal category is

a) 4.4 g
b)3.8 g
c) 5.7 g

7. For a given bank angle the load factor imposed on both the aeroplane and pilot in a co-ordinated constant altitude turn
a) is constant
b)is directly related to airplanes gross weight
c) is varied with the ratio of turn

8. The degree of aeroplane wing loading during level coordinated turn in smooth air depends upon
a) angle of bank
b)rate of turn
c) density altitude

9. The primary purpose of wing spoilers is to
a) decrease lift of the wing by disturbing the airflow
b)decrease landing speed
c) increase drag

10. Wing flap is a
a) primary control surface
b)secondary control surface
c) high lift device

This is exam number 39.

ANSWERS

1.	2	3	4	5	6	7	8	9	10
A	C	A	C	A					

1. Gliding angle is the angle between
a) ground and the glide path
b)aircraft and flight path
c) aircraft and airflow

2. Frise ailerons are used to minimise
a) giving stability
b)lateral stability
c) adverse yaw

3. During steep dive , the load factor will be
a) zero
b)2g
c) -1g

4. Which statement is true regarding CofG location and drag?
a) If loaded with CofG aft, but within limits, the aeroplane will cruise at a slower airspeed because of increased drag.
b)If loaded with CofG forward the aircraft will cruise at a faster speed because of reduced drag.
c) If loaded with CofG aft but within limit, the aircraft will cruise at faster airspeed because of reduced air drag.

5. Propeller Solidity can be increased by
a) increasing the blade angle
b)increasing the number of blades

c) decreasing the length of the blades

6.
a)
b)
c)

7.
a)
b)
c)

8.
a)
b)
c)

9.
a)
b)
c)

10.
a)
b)
c)