3890. The point about which the wing pitching moment is independent of angle of attack is called:

A – the pitching centre
B – the centre of gravity
C – the centre of pressure
D – the aerodynamic centre

Ref: AIR: atpl, cpl;

Ans: D

4184. The unit of measurement of pressure is:

A – psi
B – kg/m^3
C – lb/gal
D – kg/dm^2

Ref: AIR: atpl, cpl;

Ans: A

4189. The unit of density is:

A – Bar
B – psi
C – kg/cm^2
D – kg/m^3

Ref: AIR: atpl, cpl;

Ans: D

4199. The angle of attack of a wing profile is defined as the angle between:

A – the undisturbed airflow and the chordline
B – the local airflow and the mean camberline
C – the local airflow and the chordline
D – the undisturbed airflow and the mean camberline

Ref: AIR: atpl, cpl;

Ans: A

7925. As subsonic air flows through a convergent duct:

(i) static pressure
(ii) velocity

A – (i) increases and (ii) decreases
B – (i) increases and (ii) increases
C – (i) decreases and (ii) decreases
D – (i) decreases and (ii) increases

Ref: AIR: atpl, cpl;

Ans: D

7938. Dihedral of the wing is:

A – the angle between the 0.25 chord line of the wing and the vertical axis
B – the angle between the leading edge of the wing and the lateral axis
C – the angle between the 0.25 chord line of the wing and the lateral axis
D – the angle between the 0.25 chord line of the wing and the horizon

Ref: AIR: atpl, cpl;

Ans: C

7945. Which one of the following statements about Bernoullis theorem is correct?

A – The dynamic pressure is maximum in the stagnation point
B – The dynamic pressure decreases as static pressure decreases
C – The total pressure is zero when the velocity of the stream is zero
D – The dynamic pressure increases as static pressure decreases

Ref: AIR: atpl, cpl;

Ans: D

7952. A wing has a span of 50 feet and an area of 200 square feet. Its mean chord would be:

A – 4 feet
B – 10 feet
C – 7.5 feet
D – 2.5 feet

Ref: AIR: atpl, cpl;

Ans: A

7966. On a symmetrical aerofoil, the pitch moment for which Cl=0 is:

A – zero
B – equal to the moment coefficient for stabilized angle of attack
C – positive (pitch-up)
D – negative (pitch-down)

Ref: AIR: atpl, cpl;

Ans: A

15607. The angle of attack (aerodynamic angle of incidence) of an aerofoil is the angle between the:

A – bottom surface and the chord line
B – chord line and the relative undisturbed airflow
C – bottom surface and the Horizontal
D – bottom surface and the relative airflow

Ref: AIR: atpl, cpl;

Ans: B

15609. Which formula or equation describes the relationship between force (F), acceleration (a) and mass (m)?

A – m = F.a
B – a = F.m
C – F = m/a
D – F = m.a

Ref: AIR: atpl, cpl;

Ans: D

15610. The static pressure is acting:

A – only perpendicular to the direction of the flow
B – only in the direction of the total pressure
C – in all directions
D – only in direction of the flow

Ref: AIR: atpl, cpl;

Ans: C

23285. The most correct list of 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 section, air density
D – incidence, TAS, wing plan, leading edge radius and thrust

Ref: AIR: atpl, cpl;

Ans: C

23287. A wing has a mean chord of 6 metres and a span of 30 metres. The aspect ratio is:

A – 5 to 1
B – 30 to 1
C – 180 to 1
D – 6 to 1

Ref: AIR: atpl, cpl;

Ans: A

23289. Lift of a wing is increased by:

A – an increase in the temperature of the atmosphere
B – an increase in the pressure of the atmosphere
C – an increase in the humidity of the atmosphere
D – a decrease in the density of the atmosphere at a constant TAS

Ref: AIR: atpl, cpl;

Ans: B

23300. A swept wing:

A – produces more lift at a given angle of attack than an equivalent straight wing
B – reaches the critical angle of attack before an equivalent straight wing
C – produces less lift at a given angle of attack than an equivalent straight
D – produces zero lift at zero angle of attack

Ref: AIR: atpl, cpl;

Ans: C

23310. To convert knots into miles per hour:

A – multiply the knots by 0.87
B – divide the knots by 0.87
C – multiply the knots by 0.87 and divide by the relative density
D – divide the knots by 8.7

Ref: AIR: atpl, cpl;

Ans: B

23312. The aerodynamic centre is the point on the chord line where:

A – drag acts
B – the sum of all aerodynamic forces act
C – the geometric centre of the wing is located
D – the pitching moment remains constant throughout changes in angle of attack within the normal range

Ref: AIR: atpl, cpl;

Ans: D

23313. The nose up or nose down orientation of an aircraft relative to the horizon is known as:

A – the angle of attack
B – the angle of incidence
C – the attitude of the aircraft
D – the angle between the relative airflow and the chord line of the wing

Ref: AIR: atpl, cpl;

Ans: C

23314. Airflow, the product of the aircraft moving forwards, parallel to and in the opposite direction to the flight path, its pressure, temperature and relative velocity unaffected by the presence of the aircraft:

A – is known as static pressure
B – is known as dynamic pressure
C – is known as total pressure
D – is known as relative airflow

Ref: AIR: atpl, cpl;

Ans: D

23488. Vy is defined as:

A – speed for best rate of descent
B – speed for best angle of climb
C – speed for best rate of climb
D – maximum speed which should be used in a climb

Ref: AIR: atpl, cpl;

Ans: C

23532. If air is assumed to be incompressible, this means:

A – there will be no change in pressure when the speed of the airflow is changed
B – there will be no change of density due to change of pressure
C – the density will only change with speed at supersonic speed
D – pressure changes will only occur at very high speeds

Ref: AIR: atpl, cpl;

Ans: B

23579. A line from the centre of curvature of the leading edge to the trailing edge, equidistant from the top and bottom wing surfaces is:

A – camber line
B – upper camber line
C – mean chord
D – mean aerodynamic chord

Ref: AIR: atpl, cpl;

Ans: A

23599. What is the SI unit for density?

A – mV2
B – kg/cm2
C – kg-m
D – kg/m3

Ref: AIR: atpl, cpl;

Ans: D

4278. Consider an aerofoil with a certain camber and a positive angle of attack. At which location will the highest flow velocities occur?

A – Upper side
B – Lower side
C – In front of the stagnation point
D – In the stagnation point

Ref: AIR: atpl, cpl;

Ans: A

7648. Which of the following is the greatest factor causing lift?

A – Increased airflow velocity below the wing
B – Increased pressure below wing
C – Suction above the wing
D – Decreased airflow velocity above the wing

Ref: AIR: atpl, cpl;

Ans: C

7679. On a cambered airfoil the zero lift angle of attack will be:

A – dependent on the wing aspect ratio
B – positive
C – negative
D – zero

Ref: AIR: atpl, cpl;

Ans: C

7684. What is the purpose of a slat on the leading edge?

A – Decelerate the air over the top surface
B – Thicken the laminar boundary layer over the top surface
C – Increase the camber of the wing
D – Allow greater angle of attack

Ref: AIR: atpl, cpl;

Ans: D

21151. What is the stagnation point?

A – The intersection of the total aerodynamic force and the chord line
B – The point where the velocity of the relative airflow is reduced to zero
C – The intersection of the thrust vector and the chord line
D – The point, relative to which the sum total of all moments is independent of angle of attack

Ref: AIR: atpl, cpl;

Ans: B

21186. Which statement is correct?

1. The angle of attack of a positively cambered aerofoil has a negative value when the lift coefficient equals zero
2. There is a nose down pitching moment about a positively cambered aerofoil when the lift coefficient equal

A – 1 is incorrect and 2 is correct
B – 1 is correct and 2 is incorrect
C – 1 is correct and 2 is correct
D – 1 is incorrect and 2 is incorrect

Ref: AIR: atpl, cpl;

Ans: C

23203. A symmetrical aerofoil set at zero angle of attack in an air stream will produce:

A – lift and drag
B – no lift and no drag
C – lift but no drag
D – drag but no lift

Ref: AIR: atpl, cpl;

Ans: D

23211. The centre of pressure of an aerofoil is:

A – the point where the pressure on the upper surface of the wing is lowest
B – the centre of gravity of the aerofoil
C – the point where the pressure on the lower surface of the wing is highest
D – the point on the chord line where the resultant lift force acts

Ref: AIR: atpl, cpl;

Ans: D

23668. When considering the aerodynamic forces acting on an aerofoil section:

A – lift and drag increase linearly with an increase in angle of attack
B – lift and drag act normal to each other only at one angle of attack
C – lift and drag increase exponentially with an increase in angle of attack
D – lift increases linearly and drag increases exponentially with an increase in angle of attack

Ref: AIR: atpl, cpl;

Ans: D

23720. Consider a positively cambered aerofoil section, the pitching moment when Cl = 0 will be:

A – negative
B – infinite
C – positive
D – equal to zero

Ref: AIR: atpl, cpl;

Ans: A

24539. On a cambered airfoil, as the angle of attack increases from zero to about ten degrees, the Centre of Pressure:

A – Moves back and then forward
B – Remains in the same place
C – Moves forward and then remains in the same place
D – Moves back and then remains in the same place

Ref: AIR: atpl, cpl;

Ans: C

081-01-03 The coefficients

2627. An aeroplane maintains straight and level flight while the IAS is doubled. The change in lift coefficient will be:

A – x 0.25
B – x 2.0
C – x 0.5
D – x 4.0

Ref: AIR: atpl, cpl;

Ans: A

7682. A body is placed in a certain airstream. The density of the airstream decreases to half of the original value. The aerodynamic drag will decrease with a factor:

A – 4
B – 2
C – 8
D – 1.4

Ref: AIR: atpl, cpl;

Ans: B

7709. The aerofoil polar is:

A – the relation between the horizontal and the vertical speed
B – a graph of the relation between the lift coefficient and the angle of attack
C – a graph of the relation between the lift coefficient and the drag coefficient
D – a graph, in which the thickness of the wing aerofoil is given as a function of the chord

Ref: AIR: atpl, cpl;

Ans: C

7714. An aeroplane performs a straight and level horizontal flight at the same angle of attack at two different altitudes. (all other factors of importance being constant, assume ISA conditions and no compressibility effects)

A – the TAS at the higher altitude is higher
B – the TAS at both altitudes is the same
C – the TAS at the higher altitude cannot be determined
D – the TAS at the higher altitude is lower

Ref: AIR: atpl, cpl;

Ans: A

7755. The terms q and S in the lift formula are:

A – square root of surface and wing loading
B – dynamic pressure and the area of the wing
C – static pressure and wing surface area
D – static pressure and dynamic pressure

Ref: AIR: atpl, cpl;

Ans: B

7826. The aerodynamic drag of a body, placed in a certain airstream depends amongst others on:

A – the airstream velocity
B – the specific mass of the body
C – the weight of the body
D – the c.g. location of the body

Ref: AIR: atpl, cpl;

Ans: A

7834. A body is placed in a certain airstream. The airstream velocity increases by a factor 4. The aerodynamic drag will increase with a factor:

A – 8
B – 4
C – 16
D – 12

Ref: AIR: atpl, cpl;

Ans: C

7867. When considering an angle of attack versus coefficient of lift graph for a cambered aerofoil, where does the lift curve intersect the vertical CL axis?

A – Above the origin
B – Below the origin
C – At the point of origin
D – To the left of the origin

Ref: AIR: atpl, cpl;

Ans: A

7902. Comparing the lift coefficient and drag coefficient at normal angle of attack:

A – CL is much greater than CD
B – CL has approximately the same value as CD
C – CL is lower than CD
D – CL is much lower than CD

Ref: AIR: atpl, cpl;

Ans: A

21090. In what way do (1) induced drag and (2) parasite drag alter with increasing speed in straight and level flight?

A – (1) increases and (2) increases
B – (1) decreases and (2) increases
C – (1) decreases and (2) decreases
D – (1) increases and (2) decreases

Ref: AIR: atpl, cpl;

Ans: B

21092. Interference drag is the result of:

A – separation of the induced vortex
B – downwash behind the wing
C – aerodynamic interaction between aeroplane parts (eg. wing/fuselage)
D – the addition of induced and parasite drag

Ref: AIR: atpl, cpl;

Ans: C

21096. Minimum drag of an aeroplane in straight and level flight occurs at the:

A – maximum CL-CD ratio
B – minimum speed
C – minimum CD value
D – minimum angle of attack

Ref: AIR: atpl, cpl;

Ans: A

21119. The effect of the wing downwash on the static longitudinal stability of an aeroplane is:

A – negligible
B – negative
C – positive
D – smallest at high values of the lift coefficient

Ref: AIR: atpl, cpl;

Ans: B

21179. Which statement is correct?

A – Tip vortices and induced drag decrease with increasing angle of attack
B – Tip vortices can be diminished by vortex generators
C – The flows on the upper and lower surfaces of the wing are both in wing tip direction
D – The flow on the upper surface of the wing has a component in wing root direction

Ref: AIR: atpl, cpl;

Ans: D

23207. The calibration for the ASI is based on density:

A – at the normal cruising altitude
B – at the tropopause
C – at sea level, ISA temperature
D – at sea level, ISA+15ºC

Ref: AIR: atpl, cpl;

Ans: C

23220. For an aircraft flying at a constant IAS:

A – the drag will be less at altitude than at sea level because the TAS is lower
B – the drag will be less at altitude than at sea level because density is lower
C – the drag will be greater at altitude than at sea level because TAS is higher
D – the drag will be the same at altitude as at sea level

Ref: AIR: atpl, cpl;

Ans: D

23221. For an aircraft in level flight, induced drag:

A – would be less if the aspect ratio was increased
B – would be greater if the aspect ratio was increased
C – would be less if the weight was increased
D – would be independent of aspect ratio

Ref: AIR: atpl, cpl;

Ans: A

23224. To fly at a given IAS, the thrust required at altitude:

A – will be less than at sea level
B – will be the same as at sea level and will be given by the same throttle position
C – will be the same as at sea level, but will require the throttle to be advanced
D – will be greater than at sea level

Ref: AIR: atpl, cpl;

Ans: C

23225. An aircraft at an IAS of 150kts at sea level, then flies at 10,000ft, the drag will:

A – be greater at sea level than at 10,000 ft
B – be greater at 10,000 ft than at sea level
C – be the same
D – depends on the angle of incidence

Ref: AIR: atpl, cpl;

Ans: C

23232. Induced drag of an aircraft would be increased with:

A – increased speed
B – increased weight
C – increased aspect ratio
D – decreased angle of attack

Ref: AIR: atpl, cpl;

Ans: B

23237. A swept wing compared to the same wing without sweep will give:

A – the same lift at a given angle of attack but a lower Cl max
B – more lift at a given angle of attack
C – less lift at a given angle of attack
D – the same lift at a given angle of attack and a higher Cl max

Ref: AIR: atpl, cpl;

Ans: C

23609. The speed for minimum sink rate is:

A – faster than Vmd
B – slower than Vmd
C – Vmd
D – not related to Vmd

Ref: AIR: atpl, cpl;

Ans: B

24547. When an aircraft selects its undercarriage and flaps down in flight, its VIMD will (i) ___ and if it maintained the clean configuration VIMD its speed stability would (ii) ___.

A – Increase/Reduce
B – Increase/Increase
C – Reduce/Reduce
D – Reduce/Increase

Ref: AIR: atpl, cpl;

Ans: D

081-01-06 The ground effect

4211. What is the effect on induced drag on entering the ground effect?

A – Induce drag increases, but profile drag decreases
B – Induced drag remains the same
C – Induced drag decreases
D – Induced drag increases

Ref: AIR: atpl, cpl;

Ans: C

4212. When an aircraft enters ground effect:

A – the total reaction vector is unaffected
B – the total reaction vector is inclined forwards, reducing drag
C – the total reaction vector is inclined rearwards, increasing drag
D – the total reaction vector is inclined forwards, increasing drag

Ref: AIR: atpl, cpl;

Ans: B

7675. Ground effect is most likely to result in which problem?

A – Deep stall
B – Hard landings
C – Becoming airborne before reaching recommended takeoff speed
D – Inability to et airborne even though airspeed is sufficient for normal takeoff needs

Ref: AIR: atpl, cpl;

Ans: C

7763. Ground Effect occurs:

A – acts like a decrease in aspect ratio
B – is only effective up to 1 wingspan from the ground
C – during the approach to landing
D – aids landing by increasing the induced drag

Ref: AIR: atpl, cpl;

Ans: B

7764. What will happen in ground effect?

A – an increase in strength of the wing tip vortices
B – The wing downwash on the tail surfaces increases
C – The induced angle of attack and induced drag decreases
D – A significant increase in thrust required

Ref: AIR: atpl, cpl;

Ans: C

7777. Ground effect has the following influence on the landing distance:

A – decreases
B – increases
C – does not change
D – increases, only if the landing flaps are fully extended

Ref: AIR: atpl, cpl;

Ans: B

7790. On entering ground effect, maintaining flight at the same speed:

A – ground effect has no effect on power
B – less power is required
C – more power is required
D – lift decreases

Ref: AIR: atpl, cpl;

Ans: B

7827. What effect on induced drag does entering ground effect have:

A – Increase
B – Decrease
C – Remain the same
D – Induced drag will increase, but profile drag will decrease

Ref: AIR: atpl, cpl;

Ans: B

7857. If EAS is increased by a factor of 4, by what factor would profile drag increase?

A – 16
B – 12
C – 8
D – 4

Ref: AIR: atpl, cpl;

Ans: D

7863. If an aeroplane flies in the ground effect:

A – drag and lift are reduced
B – the effective angle of attack is decreased
C – the induced angle of attack is increased
D – the lift is increased and the drag is decreased

Ref: AIR: atpl, cpl;

Ans: D

23647. When an aircraft enters ground effect:

A – the induced angle of attack increases
B – lift decreases and drag increases
C – lift increases and drag decreases
D – the aircraft will be partially supported on a cushion of air

Ref: AIR: atpl, cpl;

Ans: C

24069. When an aeroplane is in ground effect:

A – drag and lift are both increased
B – drag is increased, lift is decreased
C – drag is decreased, lift is increased
D – drag and lift

Ref: AIR: atpl, cpl;

Ans: C

081-01-07 The relation between the lift coefficient and the speed for constant lift

4188. In level flight an increase in angle of attack will cause:

A – the stagnation point to move down and aft
B – the boundary layer to become thinner
C – a decrease in pitch angle
D – the centre of pressure to move aft

Ref: AIR: atpl, cpl;

Ans: A

7692. What must happen to the CL when flaps are deployed while maintaining a constant IAS in straight and level flight?

A – Increase then decrease
B – Remain constant
C – Decrease
D – Increase

Ref: AIR: atpl, cpl;

Ans: B

15746. Compared with stalling airspeed 9VS) in a given configuration, the airspeed at which stick shaker will be triggered is:

A – 1.20 VS
B – 1.30 VS
C – 1.12 VS
D – greater than VS

Ref: AIR: atpl, cpl;

Ans: D

15748. The critical angle of attack:

A – changes with an increase in gross weight
B – remains unchanged regardless of gross weight
C – increases if the CG is moved forward
D – decreases if the CG is moved aft

Ref: AIR: atpl, cpl;

Ans: b

15752. After the transition point between the laminar and turbulent boundary layer:

A – the mean speed increases and the friction drag decreases
B – the boundary layer gets thicker and the speed decreases
C – the mean speed and friction drag increases
D – the boundary layer gets thinner and the speed increases

Ref: AIR: atpl, cpl;

Ans: C

15753. The stall speed in a 60° banked turn increases by the following factor:

A – 1.41
B – 1.07
C – 1.30
D – 2.00

Ref: AIR: atpl, cpl;

Ans: A

23660. Which of the following is true?

A – a turbulent boundary layer has more kinetic energy
B – a turbulent boundary layer is thinner
C – less skin friction is generated by a turbulent layer
D – a laminar flow boundary layer is less likely to separate

Ref: AIR: atpl, cpl;

Ans: A

23661. Stalling speed increases when:

A – recovering from a steep dive
B – the aircraft is subjected to minor altitude changes
C – the aircraft weight decreases
D – flaps are deployed

Ref: AIR: atpl, cpl;

Ans: A

23684. What happens to stall speed with flaps down?

A – increases
B – decreases
C – remains constant

Ref: AIR: atpl, cpl;

Ans: B

23685. Vs is 100 kts at n=1

What will the stall speed be if n=2?

A – 200 kt
B – 119 kt
C – 141 kt
D – 100 kt

Ref: AIR: atpl, cpl;

Ans: C

4261. Which statement is correct?

A – Spoiler extension decreases the stall speed and the minimum rate of descent, but increases the minimum descent angle
B – Extension of flaps will increase (CL/CD) max, causing the minimum rate of descent to decrease
C – Extension of flaps has no influence on the minimum rate of descent, as only the TAS has to be taken into account
D – Extension of flaps causes a reduction of the stall speed, the maximum glide distance also reduces

Ref: AIR: atpl, cpl;

Ans: D

4269. What is the effect of deploying leading edge flaps?

A – Decrease CLMAX
B – Decrease the critical angle of attack
C – Not affect the critical angle of attack
D – Increase the critical angle of attack

Ref: AIR: atpl, cpl;

Ans: D

4277. Extension of FOWLER type trailing edge lift augmentation devices, will produce:

A – a nose-down pitching moment
B – no pitching moment
C – a nose-up pitching moment
D – a force which reduces drag

Ref: AIR: atpl, cpl;

Ans: A

7663. Compared with the flap up configuration the maximum angle of attack for the flaps down configuration is:

A – unchanged
B – larger
C – smaller
D – smaller or larger depending on flap deflection

Ref: AIR: atpl, cpl;

Ans: C

7739. Deflection of leading edge flaps will:

A – increase critical angle of attack
B – decrease CLmax
C – decrease drag
D – not affect critical angle of attack

Ref: AIR: atpl, cpl;

Ans: A

7757. In order to maintain straight and level flight at a constant airspeed, whilst the flaps are being retracted, the angle of attack will:

A – increase
B – decrease
C – remain constant
D – increase or decrease depending on type of flap

Ref: AIR: atpl, cpl;

Ans: A

7779. Vortex generators:

A – take energy from the laminar flow to induce boundary layer separation
B – use free stream flow to induce laminar flow
C – prevent spanwise flow
D – use free stream flow to increase energy in the turbulent boundary layer

Ref: AIR: atpl, cpl;

Ans: D

7781. A deployed slat will:

A – decrease the boundary layer energy and decrease the suction peak on the slat, so that CLmax is reached at lower angles of attack
B – increase the boundary layer energy and increase the suction peak on the fixed part of the wing, so that the stall is postponed to higher angles of attack
C – increase the boundary layer energy, move the suction peak from the fixed part of the wing to the slat, so that the stall is postponed to higher angles of attack
D – increase the camber of the aerofoil and increase the effective angle of attack, so that CLmax is reached at higher angles of attack

Ref: AIR: atpl, cpl;

Ans: C

7958. The use of a slot in the leading edge of the wing enables the aeroplane to fly at a slower speed because:

A – it changes the camber of the wing
B – the laminar part of the boundary layer gets thicker
C – it decelerates the upper surface boundary layer air
D – it delays the stall to a higher angle of attack

Ref: AIR: atpl, cpl;

Ans: D

7967. On a wing fitted with a fowler type trailing edge flap, the Full extended position will produce:

A – an unaffected wing area and increase in camber
B – an increase in wing area and camber
C – an unaffected CD, at a given angle of attack
D – an increase in wing area only

Ref: AIR: atpl, cpl;

Ans: B

15612. Where on the surface of a typical aerofoil will flow separation normally start at high angles of attack?

A – lower side leading edge
B – upper side trailing edge
C – upper side leading edge
D – lower side trailing edge

Ref: AIR: atpl, cpl;

Ans: B

15710. If flaps are deployed at constant IAS in straight and level flight, the magnitude of tip vortices will eventually: (flap span less than wing span)

A – increase
B – remain the same
C – increase or decrease, depending on the initial angle of attack
D – decrease

Ref: AIR: atpl, cpl;

Ans: D

21014. A slat will:

A – increased the camber of the aerofoil and divert the flow around the sharp leading edge
B – prolong the stall to a higher angle of attack
C – increase the lift by increasing the wing area and the camber of the aft portion of the wing
D – provide a boundary layer suction on the upper surface of the wing

Ref: AIR: atpl, cpl;

Ans: B

21023. An aeroplane has the following flap positions: 0°, 15°, 30°, 45°
Slats can also be selected. Generally speaking, which selection provides the highest positive contribution to the CLMAX?

A – The flaps from 0° to 15°
B – The flaps from 30° to 45°
C – The slats from the retracted to the take-off position
D – The flaps from 15° to 30°

Ref: AIR: atpl, cpl;

Ans: C

21038. Compared with the clean configuration, the angle of attack at CLmax with trailing edge flaps extended is:

A – smaller or larger depending on the degree of flap extension
B – larger
C – unchanged
D – smaller

Ref: AIR: atpl, cpl;

Ans: D

21051. Extension of leading edge flaps will:

A – increase critical angle of attack
B – decrease CLmax
C – decrease drag
D – not affect critical angle of attack

Ref: AIR: atpl, cpl;

Ans: A

21100. Slat extension will:

A – increase the critical angle of attack
B – reduce tip vortices
C – create gaps between leading edge and engine nacelles
D – decrease the energy in the boundary layer on the upper side of the wing

Ref: AIR: atpl, cpl;

Ans: A

21117. The difference between the effects of slat and flap asymmetry is that:

("large" in the context of this question means not or hardly controllable by normal use of controls)

A – flap asymmetry causes a large difference in CLmax whereas slat asymmetry causes a large rolling moment at any speed
B – flap asymmetry causes a large rolling moment whereas slat asymmetry causes a large yawing moment
C – flap asymmetry causes a large yawing moment whereas slat asymmetry causes a large rolling moment at any speed
D – flap asymmetry causes a large rolling moment at any speed whereas slat asymmetry causes a large difference in CLmax

Ref: AIR: atpl, cpl;

Ans: D

21135. Trailing edge flaps once extended:

A – degrade the best angle of glide
B – increase the zero lift angle of attack
C – significantly increase the angle of attack for maximum lift
D – significantly lower the drag

Ref: AIR: atpl, cpl;

Ans: A

21138. Upon extension of Fowler flaps whilst maintaining the same angle of attack:

A – CL increases, while CD remains unaffected
B – CL and CD increase
C – CD decreases, while the centre of lift shifts aft
D – CL decreases, while the centre of lift shifts forward

Ref: AIR: atpl, cpl;

Ans: B

23345. A Krueger flap is:

A – part of the upper surface of the leading edge, which moves forward
B – part of the lower surface of the leading edge, hinged at its forward edge
C – a flap which extends rearward from the trailing edge
D – a flap which extends from the upper surface of the wing, to increase drag

Ref: AIR: atpl, cpl;

Ans: B

23346. The type of flap which extends backwards from the trailing edge as its lowered is:

A – a split flap
B – a Krueger flap
C – a Fowler flap
D – a Lower flap

Ref: AIR: atpl, cpl;

Ans: C

23347. A low wing monoplane has its tail plane mounted on the top of the fin. When the Fowler flaps deploy the aircraft will:

A – tend to pitch nose up
B – tend to pitch nose down
C – tend to remain in a level attitude
D – lose altitude and pitch nose up

Ref: AIR: atpl, cpl;

Ans: B

23348. Because of the reduction in Cl when the flaps are raised in flight to maintain level flight, the angle of attack:

A – would have to be decreased
B – would have to be increased
C – would be required to remain the same

Ref: AIR: atpl, cpl;

Ans: B

23617. When a Fowler flap moves rearwards the wing area:

A – increases and camber increases
B – decreases and camber decreases
C – is unaffected as is the camber
D – increases and camber decreases

Ref: AIR: atpl, cpl;

Ans: A

23687. What effect has a plain flap on Cl?

A – increase camber
B – increases angle of attack
C – changes position of CP
D – decreases the aspect ratio

Ref: AIR: atpl, cpl;

Ans: A

23698. In order to maintain straight and level flight when trailing edge flaps are retracted, the angle of attack must:

A – be increased or decreased depending on type of flap
B – be decreased
C – be increased
D – stay the same because the lift requirement will be the same

Ref: AIR: atpl, cpl;

Ans: C

23702. On a highly swept back wing with leading edge flaps and leading edge slats, which device would be fitted in the following locations?

A – slats inboard/flaps outboard
B – slats outboard/flaps inboard
C – alternating slats and flaps
D – no preferred positions

Ref: AIR: atpl, cpl;

Ans: B

23553. Vmo can be exceeded in a descent at a constant mach number because:

A – Vmo is an IAS and descending at a constant mach will require a decrease in TAS which will reduce dynamic pressure
B – as altitude is reduced the speed of sound will increase which increases IAs
C – as altitude decreases the ASI will start to under-read due to the increasing air density
D – Vmo is an IAS and descending at a constant mach will require an increase in TAS which will increase dynamic pressure

Ref: AIR: atpl;

Ans: D

23604. An aircraft is descending at a constant mach number, which of the following operational speed limitations may be exceeded?

A – Vmo
B – Vne
C – Mmo
D – Vd

Ref: AIR: atpl;

Ans: A

23619. The speed of sound is affected by the:

A – density
B – humidity
C – pressure
D – temperature

Ref: AIR: atpl;

Ans: D

23680. What happens to mach number if IAS is increased when flying at FL390?

A – remain constant
B – increase
C – decrease
D – depends on the OAT

Ref: AIR: atpl;

Ans: B

3795. When the air has passed through a normal shock wave the Mach number is?

A – Higher than before
B – Loer than before but still greater than 1
C – Equal to 1
D – Less than 1

Ref: AIR: atpl;

Ans: D

3796. In the transonic range lift will decrease at the shock stall due to the:

A – first appearance of a shock wave at the upper side of the wing
B – attachment of the shock wave on the trailing edge of the wing
C – separation of the boundary layer at the shock waves
D – appearance of the bow wave

Ref: AIR: atpl;

Ans: C

3797. Shock induced separation results in:

A – constant lift
B – decreasing lift
C – increasing lift
D – decreasing drag

Ref: AIR: atpl;

Ans: B

3801. The high speed buffet is induced by:

A – a shift of the centre of gravity
B – boundary layer control
C – expansion waves on the wing upper side
D – boundary layer separation due to shock waves

Ref: AIR: atpl;

Ans: D

3802. For minimum wave drag, an aircraft should be operated at which of the following speeds?

A – Mach 1.0
B – High supersonic
C – Low supersonic
D – Subsonic

Ref: AIR: atpl;

Ans: D

3804. What data may be obtained from the Buffet Onset Boundary chart?

A – The values of MMO at different weights and altitudes
B – The values of the Mach Number at which low speed and Mach Buffet occur at different weights and altitudes
C – The values of Mcrit at different weights and altitudes
D – The values of the Mach Number at which low speed and shock-stall occur at different weights and altitudes

Ref: AIR: atpl;

Ans: B

3806. If an aeroplane is flying at transonic speed with increasing Mach number the shock wave on the upper side of the wing:

A – moves into leading edge direction
B – moves into trailing edge direction
C – stays all the time at the same position
D – disappears

Ref: AIR: atpl;

Ans: B

3807. Which statement is correct about a normal shock wave?

A – The airflow expands when passing the aerofoil
B – The airflow changes direction
C – The airflow changes from subsonic to supersonic
D – The airflow changes from supersonic to subsonic

Ref: AIR: atpl;

Ans: D

3855. The application of the area rule on aeroplane design will decrease the:

A – wave drag
B – skin friction drag
C – induced drag
D – form drag

Ref: AIR: atpl;

Ans: A

3856. Air passes a normal shock wave. Which of the following statements is correct?

A – The temperature increases
B – The pressure decreases
C – The temperature decreases
D – The velocity increases

Ref: AIR: atpl;

Ans: A

3859. (Refer to figure 081-19)

In 1G level flight at FL340 and at an aircraft weight of 110.000 kg and a CG at 35% MAC your low speed and high speed buffet boundaries will be:

A – M 0.54; M 0.82
B – M 0.60; M 0.78
C – M 0.49; MMO
D – M 0.54; M 0.84

Ref: AIR: atpl;

Ans: D

3860. (Refer to figure 081-05)

At an aircraft weight of 70.000 lbs your aerodynamic ceiling in 1G level flight will be:

A – FL320
B – FL390
C – FL420
D – FL440

Ref: AIR: atpl;

Ans: C

21189. Whilst flying at a constant IAS and at n = 1, as the aeroplane mass decreases the value of Mcrit:

A – decreases
B – remains constant
C – is independent of the angle of attack
D – increases

Ref: AIR: atpl;

Ans: D

23483. What is the free stream Mach number which produces first evidence of local sonic flow?

A – the transonic mach number
B – the critical mach number
C – M 1.0
D – Mmo

Ref: AIR: atpl;

Ans: B

23505. At Mcrit, a shockwave will appear first:

A – at the leading edge
B – near to the point of maximum wing thickness
C – at the trailing edge
D – on the underside of the wing

Ref: AIR: atpl;

Ans: B

23506. The critical Mach number is:

A – the mach number when the aircraft reaches the speed of sight
B – the mach number when a shock wave forms at the leading edge
C – the aircraft's mach number when the airflow reaches the speed of sound at some point on the aircraft
D – the maximum speed at which the aircraft is permitted to fly during normal operations

Ref: AIR: atpl;

Ans: C

23628. Which of the following is the correct definition of the free stream Mcrit?

A – when the local velocity reaches mach 1
B – when shock stall first occurs
C – when the shock wave on the top surface and the bottom surface both reach the trailing edge
D – equal to the local speed of sound

Ref: AIR: atpl;

Ans: A

23638. What wing design features will help increase Mcrit?

A – sweep bak/thin aerofoil
B – positive camber/sweepback
C – dihedral/thin aerofoil
D – negative camber/sweepback

Ref: AIR: atpl;

Ans: A

23640. In the transonic speed range, what affects the flight handling characteristics?

A – IAS
B – CAS
C – TAS
D – Mach number

Ref: AIR: atpl;

Ans: D

23642. What phenomenon can exist at low Mach number?

A – mach tuck
B – shock waves
C – dutch roll
D – tuck under

Ref: AIR: atpl;

Ans: C

23664. Tuck under occurs at:

A – all mach numbers
B – above and below Mcrit
C – mach numbers above Mcrit
D – mach numbers below Mcrit

Ref: AIR: atpl;

Ans: C

23665. What happens to Mcrit if weight decreases?

A – increases
B – decreases
C – remains constant

Ref: AIR: atpl;

Ans: A

23676. Which of the following will give an increase in Mcrit?

A – low thickness/chord ratio
B – large leading edge radius
C – cambered surface

Ref: AIR: atpl;

Ans: A

23678. Deflecting a control surface down will cause Mcrit to:

A – increase
B – decrease
C – remain the same

Ref: AIR: atpl;

Ans: B

3808. Two methods to increase the critical Mach Number are:

A – thin aerofoils and sweep back of the wing
B – thin aerofoils and dihedral of the wing
C – positive cambering of the aerofoil and sweep back of the wing
D – thick aerofoils and dihedral of the wing

Ref: AIR: atpl;

Ans: A

3811. The consequences of exceeding Mcrit in a swept-wing aeroplane may be: (assume no corrective devices, straight and level flight)

A – buffeting of the aeroplane and a tendency to pitch up
B – an increase in speed and a tendency to pitch up
C – engine unbalance and buffeting
D – buffeting of the aeroplane and a tendency to pitch down

Ref: AIR: atpl;

Ans: D

3820. Compared to straight wings of the same airfoil section swept wings ___ the onset of the transonic drag rise and have a ___ CD in supersonic flight:

A – delay, lower
B – hasten, lower
C – hasten, higher
D – delay, higher

Ref: AIR: atpl;

Ans: D

3823. What is the effect of a decreasing aeroplane weight on Mcrit at n=1, when flying at constant IAS? The value of Mcrit:

A – increases
B – remains constant
C – is independent of the angle of attack
D – decreases

Ref: AIR: atpl;

Ans: A

23414. What is the principal advantage of sweepback?

A – accelerates the onset of compressibility effect
B – the Mcrit will increase
C – increases changes in the magnitude of force coefficients due to compressibility
D – lateral stability is reduced

Ref: AIR: atpl;

Ans: B

23482. The purpose of vortex generators on a high speed aircraft is to:

A – prevent the formation of shock waves
B – induce a root stall
C – reduce induced drag
D – delay boundary layer separation

Ref: AIR: atpl;

Ans: D

23508. For a wing of low thickness/chord ratio the critical mach number will be:

A – higher than a wing of high thickness/chord ratio
B – lower than a wing of high thickness/chord ratio
C – the same as a wing of high thickness/chord ratio
D – higher only if the wing has a supercritical section

Ref: AIR: atpl;

Ans: A

23572. The purpose of vortex generators is:

A – prevent span wise flow
B – to reduce the severity of shock induced airflow separation
C – prevent tip stalling on a swept wing
D – to de-energise the boundary layer

Ref: AIR: atpl;

Ans: B

3587. On a non-swept wing, when the aerofoil is accelerated from subsonic to supersonic speeds, the aerodynamic centre:

A – shifts from 25% to about 50% of the aerofoil chord
B – shifts aft by about 10%
C – remains unchanged
D – slightly shifts forward

Ref: AIR: atpl;

Ans: A

3588. When airflow over a wing becomes supersonic, the pressure pattern over the surface will become:

A – the same as subsonic
B – irregular
C – rectangular
D – triangular

Ref: AIR: atpl;

Ans: C

3591. If an aeroplane is accelerated from subsonic to supersonic speeds, the centre of pressure will move:

A – to a position near the trailing edge
B – forward
C – to a position near the leading edge
D – to the mid chord position

Ref: AIR: atpl;

Ans: D

3594. When a supersonic airflow passes through an oblique shockwave static pressure will ___ and temperature will ___

A – rise; rise
B – fall; rise
C – fall; fall
D – rise; fall

Ref: AIR: atpl;

Ans: A

3611. How will the density and temperature change in a supersonic flow from a position in front of a shock wave to behind it?

A – Density will increase, temperature will increase
B – Density will increase, temperature will decrease
C – Density will decrease, temperature will increase
D – Density will decrease, temperature will decrease

Ref: AIR: atpl;

Ans: A

3613. When a supersonic airflow passes through an expansion wave speed will ___ and temperature ___

A – decrease; fall
B – decrease; rise
C – increase; rise
D – increase; fall

Ref: AIR: atpl;

Ans: D

3614. When the air is passing through an expansion wave the Mach number will:

A – decrease
B – increase
C – stay constant
D – decrease and beyond a certain Mach number start increasing again

Ref: AIR: atpl;

Ans: B

3615. The shock wave angle of a supersonic aircraft at increasing Mach Number:

A – remain the same
B – decreases
C – increases
D – decreases, the increases above certain Mach number

Ref: AIR: atpl;

Ans: B

3932. If the aircraft is properly loaded the CG, the neutral point and the manoeuvre point will be in the order given, forward to aft:

A – manoeuvre point, neutral point, CG
B – manoeuvre point, CG, neutral point
C – CG, neutral point, manoeuvre point
D – CG, manoeuvre point, neutral point

Ref: AIR: atpl, cpl;

Ans: C

3935. If the total sum of moments about one of its axis is not zero, an aeroplane:

A – would fly a path with a constant curvature
B – would be difficult to control
C – would experience an angular acceleration about that axis
D – would not be affected because the situation is normal

Ref: AIR: atpl, cpl;

Ans: C

3956. If the sum of moments in flight is not zero, the zero plane will rotate about:

A – the aerodynamic centre of the wing
B – the neutral point of the aeroplane
C – the centre of gravity
D – the centre of pressure of the wing

Ref: AIR: atpl, cpl;

Ans: C

23330. Speed stability of an aircraft:

A – is stable below Vmd because total drag decreases as speed decreases
B – is unstable above Vmd because thrust decreases as speed increases
C – is unstable below Vmd because total drag decreases as speed decreases
D – is stable above Vmd because total drag increases as speed increases

Ref: AIR: atpl, cpl;

Ans: D

23331. An aircraft is said to have speed stability:

A – if it recovers from displacements about any of the three axes at all speeds
B – if it can be trimmed to fly at any speed between stalling speed and Vne
C – when the speed is disturbed from its trimmed value, it tends to return to the original speed
D – if it can fly a 3 degree glide slope without the need to adjust the thrust setting

Ref: AIR: atpl, cpl;

Ans: C

23544. If an aircraft has negative dynamic and positive static stability, this will result in:

A – undamped oscillations
B – convergent oscillations
C – divergent oscillations
D – damped oscillations

Ref: AIR: atpl, cpl;

Ans: C

23627. If an aircraft has positive static stability:

A – It is always dynamically stable
B – it is always dynamically unstable
C – it can be dynamically neutral stable or unstable
D – it is always dynamically neutral

Ref: AIR: atpl, cpl;

Ans: C

081-04-02 Methods of achieving balance

3878. For a normal stable aeroplane, the centre of gravity is located:

A – aft of the neutral point of the aeroplane
B – with a sufficient minimum margin ahead of the neutral point of the aeroplane
C – at the neutral point of the aeroplane
D – between the aft limit and the neutral point of the aeroplane

Ref: AIR: atpl, cpl;

Ans: B

3892. The distance between the CG Datum and the CG Neutral Point in straight and level flight is called the:

A – CG forward limit
B – CG aft limit
C – CG static margin
D – CG manoeuvre margin

Ref: AIR: atpl, cpl;

Ans: C

3927. In a twin-engined jet powered aeroplane (engines mounted below the low wings) the thrust is suddenly increased. Which elevator deflection will be required to maintain the pitching moment zero?

A – Down
B – UP
C – No elevator movement will be required because the thrust line of the engines remains unchanged
D – It depends on the position of the centre of gravity

Ref: AIR: atpl, cpl;

Ans: A

21070. How can the designer of an aeroplane with straight wings increase the static lateral stability?

A – By increasing the aspect ratio of the vertical stabiliser, whilst maintaining a constant area
B – By fitting a ventral fin (a fin at the under side of the aeroplane)
C – By applying wing twist
D – By increasing anhedral

Ref: AIR: atpl, cpl;

Ans: A

23383. If an aircraft is stable, this means that:

A – it is in a state of balance
B – all the stick forces have been trimmed out
C – if it is displaced it will return to its original position without any correction by the pilot
D – if it is displaced it must be returned to its original position by the pilot

Ref: AIR: atpl, cpl;

3925. Which part of an aeroplane provides the greatest positive contribution to the static longitudinal stability?

A – The engine
B – The horizontal tailplane
C – The fuselage
D – The wing

Ref: AIR: atpl, cpl;

Ans: B

3926. Which of the following statements is correct?

A – Dynamic stability means that after being displaced from original equilibrium condition, the aeroplane will return to that condition without oscillation
B – Static stability means that the aeroplane is also dynamically stable about the relevant axis
C – Dynamic stability is possible only when the aeroplane is statically stable about the relevant axis
D – A dynamically stable aeroplane would be almost impossible to fly manually

Ref: AIR: atpl, cpl;

Ans: C

3930. Dynamic longitudinal stability requires:

A – an effective elevator
B – a small CG range
C – positive static longitudinal stability
D – a variable incidence (trimming) tailplane

Ref: AIR: atpl, cpl;

Ans: C

3934. Which of the following components is most important in determining longitudinal static stability?

A – Fuselage
B – Wings
C – Engines
D – Horizontal tailplane

Ref: AIR: atpl, cpl;

Ans: D

15715. Positive static stability of an aeroplane means that once it has been displaced the:

A – tendency will be to move with an oscillating motion of decreasing amplitude
B – tendency will be to move with an oscillating motion of increasing amplitude
C – initial tendency to move is towards its equilibrium position
D – initial tendency to move is away from its equilibrium position

Ref: AIR: atpl, cpl;

Ans: C

21080. If the static lateral stability of an aeroplane is increased, whilst its static directional stability remains constant:

A – its sensitivity to Dutch roll increases
B – its spiral stability decreases
C – turning flight becomes more difficult
D – the nose-down pitching moment in a turn increases

Ref: AIR: atpl, cpl;

Ans: A

21112. The contribution of swept back wings to static directional stability:

A – is nil
B – is negative
C – is positive
D – decreases as the sweepback increases

Ref: AIR: atpl, cpl;

Ans: C

21113. The contribution to the static directional stability of a straight wing with high aspect ratio and without dihedral:

A – is always positive
B – is always negative
C – is always negligible
D – becomes more positive as the aspect ratio increases

Ref: AIR: atpl, cpl;

Ans: C

4007. Differential aileron deflection:

A – increases the CLmax
B – is required to keep the total lift constant when ailerons are deflected
C – equals the drag of the right and left aileron
D – is required to achieve the required roll-rate

Ref: AIR: atpl, cpl;

Ans: C

4013. A modern jet aeroplane equipped with inboard and outboard ailerons plus roll control spoilers is cruising at its normal cruise Mach number:

A – only the inboard ailerons are active, the spoilers may be active
B – the inboard and outboard ailerons are active, the spoilers may be active
C – only the outboard ailerons are active, the spoilers may be active
D – only the spoilers will be active, not the ailerons

Ref: AIR: atpl, cpl;

Ans: A

4041. Roll is:

A – rotation about the longitudinal axis due to speed brake selection
B – rotation about the normal axis
C – due to aileron deflection and is motion about the lateral axis
D – rotation about the longitudinal axis

Ref: AIR: atpl, cpl;

Ans: D

4048. How is adverse yaw compensated for during entry into and roll out from a turn?

A – Anti-balanced rudder control
B – Horn-balanced controls
C – Differential aileron deflection
D – Servo tabs

Ref: AIR: atpl, cpl;

Ans: C

4051. Which motion occurs about the longitudinal axis?

A – Sideslip
B – Rolling
C – Pitching
D – Yawing

Ref: AIR: atpl, cpl;

Ans: B

4054. Which phenomenon is counteracted with differential aileron deflection?

A – Turn co-ordination
B – Aileron reversal
C – Sensitivity for spiral dive
D – Adverse yaw

Ref: AIR: atpl, cpl;

Ans: D

4058. In an aircraft fitted with spoilers for lateral control, and not deployed as speed brakes, a roll to the right is initiated by:

A – right spoiler extended, left spoiler retracted
B – both spoilers extended
C – left spoiler extended, right spoiler retracted
D – right spoiler extended, but left spoiler extended more

Ref: AIR: atpl, cpl;

Ans: A

4065. An example of differential aileron deflection during initiation of left turn is:

A – left aileron: 2” up Right aileron: 5” down
B – left aileron: 5” up Right aileron: 2” down
C – left aileron: 5” down Right aileron: 2” up
D – left aileron: 2” down Right aileron: 5” up

Ref: AIR: atpl, cpl;

Ans: B

23423. When rolling out of a steep banked turn, what causes the lowered aileron to create more drag than when rolling into the turn?

A – the wing being raised is travelling faster through the air than the wing being lowered
B – the wing being lowered is travelling faster through the air and producing more lift than the wing being raised
C – the angle of attack of the wing being raised is greater as the rollout is started
D – none of the above

Ref: AIR: atpl, cpl;

Ans: C

23424. The angle of deflection of a differential aileron when the aircraft is being rolled will be:

A – greatest on the up going aileron on the up going wing
B – greatest on the down going aileron on the up going wing
C – greatest on the up going aileron on the down going wing
D – greatest on the down going aileron on the down going wing

Ref: AIR: atpl, cpl;

Ans: C

23425. Which of the following is a true statement with regard to inboard ailerons?

A – inboard ailerons are used during low speed flight only
B – inboard ailerons are used during low speed and high speed flight
C – inboard ailerons are used during high speed flight only
D – inboard ailerons are activated by the GPWS

Ref: AIR: atpl, cpl;

Ans: B

23427. When an aircraft is rolled to the left, adverse aileron yaw will be reduced:

A – by a frise aileron being effective on the left wing
B – by fries ailerons producing increased drag on both surfaces
C – by the leading edge of the downgoing aileron protruding into the airflow
D – by the down going aileron moving through a greater angle of deflection than the up going aileron

Ref: AIR: atpl, cpl;

Ans: A

Ans: C

21078. If the nose of an aeroplane yaws left, this causes:

A – a roll to the right
B – a decrease in relative airspeed on the right wing
C – an increase in lift on the left wing
D – a roll to the left

Ref: AIR: atpl, cpl;

Ans: D

23369. What are the secondary effects of rudder and aileron respectively:

A – yaw and roll
B – roll and yaw
C – pitch and roll
D – yaw and pitch

Ref: AIR: atpl, cpl;

Ans: B

23495. When the rudder is moved to the right, the force acting on the fin:

A – gives a yawing moment but no rolling moment
B – gives a rolling moment to the left
C – gives a rolling moment to the right
D – gives a nose-up pitching moment because the force is applied above the CG

Ref: AIR: atpl, cpl;

Ans: C

23673. If an aircraft yaws to port, the secondary effect will be:

A – roll right
B – roll left
C – pitch up
D – pitch down

Ref: AIR: atpl, cpl;

Ans: B

3986. Mass balance to reduce control flutter is not required on:

A – aircraft with a fully powered irreversible control system with no manual emergency system
B – aircraft with a fully powered irreversible control system
C – aircraft limited to speeds below 200kt
D – aircraft with short rigid wings

Ref: AIR: atpl, cpl;

Ans: A

4053. When a large modern aircraft employs a variable incidence tailplane, trim changes are made by:

A – adjusting the trim tab on the trailing edge of the elevator
B – changing the angle of the entire tailplane
C – varying the spring bias trimming system
D – adjusting the Q feel unit

Ref: AIR: atpl, cpl;

Ans: B

21075. If an aeroplane exhibits insufficient stick force per g, this problem can be resolved by installing:

A – a spring which pulls the stick backwards
B – a bobweight in the control system which pulls the stick forwards
C – a spring which pulls the stick forwards
D – a bobweight in the control system which pulls the stick backwards

Ref: AIR: atpl, cpl;

Ans: B

21095. Mass-balancing of control surfaces is used to:

A – increase the stick force stability
B – limit the stick forces
C – ensure that the control surfaces are in the mid-position during taxiing
D – prevent flutter of control surfaces

Ref: AIR: atpl, cpl;

Ans: D

3644. Which of the following statements is true?

A – Limiting factors in severe turbulence are the possibility of a stall and the margin to the structural limitations
B – Through extension of the flaps in severe turbulence it is possible to reduce the speed and increase the margins to the structural limits
C – By increasing the flap setting in severe turbulence the stall speed will be reduced and the risk for exceeding the structural limits will be decreased
D – Through extension of the flaps in severe turbulence the centre of pressure will move aft which will increase the margins to the structural limits

Ref: AIR: atpl, cpl;

Ans: A

3648. For an aeroplane with one fixed value of VA the following applies. VS is:

A – the speed at which the aeroplane stalls at the manoeuvring limit load factor at MTOW
B – the maximum speed in smooth air
C – the speed at which unrestricted application of elevator control can be used, without exceeding the maximum manoeuvring limit load factor
D – just another symbol for the rough air speed

Ref: AIR: atpl, cpl;

Ans: A

3649. Flutter may be caused by:

A – distorsion by bending and torsion of the structure causing increasing vibration in the reasonable frequency
B – low airspeed aerodynamic wing stall
C – roll control reversal
D – high airspeed aerodynamic wing stall

Ref: AIR: atpl, cpl;

Ans: A

3654. What can happen to the aeroplane structure flying at a speed just exceeding VA?

A – It may break if the elevator is fully deflected upwards
B – It may suffer permanent deformation if the elevator is fully deflected upwards
C – It may suffer permanent deformation because the flight is performed at too large dynamic pressure
D – It wsill collapse if a turn is made

Ref: AIR: atpl, cpl;

Ans: B

3662. A jet transport aeroplane is in a straight climb at the constant IAS and constant weight. The operational limit that may be exceeded is:

A – VA
B – VMO
C – MMO
D – MD

Ref: AIR: atpl, cpl;

Ans: C

3665. An aircraft has a mass of 60,000 kg and a limiting positive load factor of 2.5. VA is calculated as the EAS at which full positive elevator deflection will give the limiting load factor at the stall, and is 237 kts. If the aircraft mass is reduced to 40,000 kg by fuel burn, what will be the new VA?

A – 375 kts
B – 194 kts
C – 237 kts
D – 150 kts

Ref: AIR: atpl, cpl;

Ans: B

Ans: D

3653. Which has the effect of increasing load factor (all other relevant factors being constant)?

A – Rearward CG location
B – Increased aeroplane mass
C – Increased air density
D – Vertical gusts

Ref: AIR: atpl, cpl;

Ans: D

3656. The positive manoeuvring limit load factor for a large jet transport aeroplane with flaps extended is:

A – 3.75
B – 1.5
C – 2.5
D – 2.0

Ref: AIR: atpl, cpl;

Ans: D

3658. What is the positive limit load factor for large jet transport aircraft?

A – n = 2.5
B – n = 3.75
C – n = 1.5
D – n = 1.0

Ref: AIR: atpl, cpl;

Ans: A

3659. Load factor is:

A – Lift/Weight
B – Weight/Lift
C – 1/Bank angle
D – Wing loading

Ref: AIR: atpl, cpl;

Ans: A

081-07 PROPELLERS

081-07-01 Conversion of engine torque to thrust

3672. Propeller efficiency may be defined as the ratio between:

A – the usable (power available) power and the maximum power
B – the thrust and the maximum thrust
C – usable (power available) power of the propeller and shaft power
D – the thermal power of fuel-flow and shaft power

Ref: AIR: atpl, cpl;

Ans: C

3674. If you putt back the RPM lever of a constant speed propeller during a glide with idle power and constant speed, the propeller pitch will:

A – decrease and the rate of descent will increase
B – increase and the rate of descent will increase
C – decrease and the rate of descent will decrease
D – increase and the rate of descent will decrease

Ref: AIR: atpl, cpl;

Ans: D

3676. The angle of attack of a fixed pitch propeller can be increased by:

A – reducing power and reducing TAS
B – increasing power and increasing TAS
C – reducing power and increasing TAS
D – increasing power and reducing TAS

Ref: AIR: atpl, cpl;

Ans: D

3681. Does the pitch-angle of a constant-speed propeller alter in medium horizontal turbulence?

A – Yes, but only if the pitch is full-fine
B – Yes strongly
C – No
D – Yes slightly

Ref: AIR: atpl, cpl;

21190. Why is a propeller blade twisted from root to tip?

A – To ensure that the tip produces most thrust
B – To ensure the angle of attack is greatest at the tip
C – To ensure that the root produces most thrust
D – To maintain a constant angle of attack along the whole length of the propeller blade

Ref: AIR: atpl, cpl;

Ans: D

23526. Propeller slip is the difference between the:

A – geometric pitch and the blade angle
B – geometric pitch and th effective pitch
C – plane of rotation and the aircraft's forward velocity
D – the rpm of the engine and the rpm of the propeller

Ref: AIR: atpl, cpl;

Ans: B

23527. The blade angle of a propeller is the angle between:

A – the root chord and the tip chord of the propeller
B – the chord and the airflow relative to the propeller
C – the chord of the propeller and the longitudinal axis of the aircraft
D – the propeller chord and the plane of rotation of the propeller

Ref: AIR: atpl, cpl;

Ans: D

23528. What is the primary advantage of a constant speed propeller?

A – to obtain and maintain a selected pitch angle of the blades regardless of the flight situation or power setting
B – to maintain a specific engine speed
C – to obtain a pitch setting that is suitable for each flight situation and power setting
D – to ensure that the propeller rpm is always greater than the manifold pressure

Ref: AIR: atpl, cpl;

Ans: C

23565. What is the purpose of increasing the number of propeller blades?

A – noise reduction
B – increase the power absorption
C – increase the efficiency of the variable pitch mechanism
D – enable a longer undercarriage to be used

Ref: AIR: atpl, cpl;

Ans: B

23615. What is the disadvantage of increasing the number of propeller blades?

A – decreased efficiency
B – increased noise
C – decreased power absorption
D – increased vibration

Ref: AIR: atpl, cpl;

Ans: A

081-07-04 Moments and couples due to propeller operation

2643. Asymmetric propeller blade effect is mainly induced by:

A – large angles of yaw
B – large angles of climb
C – the inclination of the propeller axis to the relative airflow
D – high speed

Ref: AIR: atpl, cpl;

Ans: C

3671. A propeller is turning to the right, seen from behind. The asymmetric thrust effect in the climb will:

A – roll the aeroplane to the right
B – roll the aeroplane to the left
C – yaw the aeroplane to the right
D – yaw the aeroplane to the left

Ref: AIR: atpl, cpl;

Ans: D

16664. A pitch up could be caused by:

A – forward movement of the centre of gravity
B – a reduction in varying loads due to G
C – forward movement of the centre of pressure
D – lateral movement of the centre of gravity

Ref: AIR: atpl, cpl;

Ans: C

16665. In a level banked turn, the stalling speed will:

A – decrease
B – increase
C – remain the same
D – vary inversely with wing loading

Ref: AIR: atpl, cpl;

Ans: B

16667. During the glide, the forces acting on an aircraft are:

A – thrust, lift and drag
B – lift, weight and thrust
C – lift, drag and weight
D – drag, thrust and weight

Ref: AIR: atpl, cpl;

Ans: C

16668. To cover the greatest distance when gliding, the gliding speed must be:

A – near to the stalling speed
B – as high as possible within V limits
C – minimum control speed
D – the one that gives the lowest total drag

Ref: AIR: atpl, cpl;

Ans: D

21047. During a straight steady climb:

1. lift is less than weight
2. lift is greater than weight
3. load factor is less than 1
4. load factor is greater than 1
5. lift is equal to weight
6. load factor is equal to 1

Which of the following lists all the correct answers?

A – 1 and 3
B – 2 and 4
C – 5 and 6
D – 1 and 6

Ref: AIR: atpl, cpl;

Ans: A

21054. For shallow climb angles the following formula can be used:

A – sin (gamma) = W/T – CD/CL
B – sin (gamma) = T/W – CD/CL
C – sin (gamma) = W/T – CL/CD
D – sin (gamma) = T/W – CL/CD

Ref: AIR: atpl, cpl;

Ans: B

21058. Given:

Aeroplane mass:	50 000 kg
Lift/Drag ratio:	10
Thrust per engine:	60 000 N
Assumed g:	10 m/s2

For a straight, steady, wings level climb of a twin engine aeroplane, the all engines climb gradient will be:

A – 3.7%
B – 14%
C – 15.7%
D – 11.7%

Ref: AIR: atpl, cpl;

Ans: B

21063. Given:

Aeroplane mass:	50 000 kg
Lift/Drag ratio:	12
Thrust per engine:	21 000 N
Assumed g:	10 m/s2

For a straight, steady, wings level climb of a four engine aeroplane, the one engine inoperative climb gradient will be:

A – 6.0%
B – 7.7%
C – 4.3%
D – 8.5%

Ref: AIR: atpl, cpl;

Ans: C

21064. Given:

Aeroplane mass:	50 000 kg
Lift/Drag ratio:	12
Thrust per engine:	28 000 N
Assumed g:	10 m/s2

For a straight, steady, wings level climb of a four engine aeroplane, the all engines climb gradient will be:

A – 8.5%
B – 8.0%
C – 9.7%
D – 2.9%

Ref: AIR: atpl, cpl;

Ans: A

21069. Given:

Aeroplane mass:	50 000 kg
Lift/Drag ratio:	12
Thrust per engine:	60 000 N
Assumed g:	10 m/s2

For a straight, steady, wings level climb of a twin engine aeroplane, the one engine inoperative climb gradient will be:

A – 3.7%
B – 15.7%
C – 14%
D – 11.7%

Ref: AIR: atpl, cpl;

Ans: A

21082. In a slipping turn (nose pointing outwards), compared with a co-ordinated turn, the bank angle (i) and the "ball" or slip indicator (ii) are respectively:

A – (i) too large; (ii) displaced towards the high wing
B – (i) too small; (ii) displaced towards the low wing
C – (i) too large; (ii) displaced towards the low wing
D – (i) too small; (ii) displaced towards the high wing

Ref: AIR: atpl, cpl;

Ans: C

21083. In a steady straight climb at climb angle "gamma", the lift of an aeroplane with weight W is approximately:

A – W x (1-tan (gamma))
B – W x (1-sin (gamma))
C – W x cos (gamma)
D – W/cos (gamma)

Ref: AIR: atpl, cpl;

Ans: C

23487. When the landing gear is lowered, given that the CG does not move longitudinally, to maintain level flight, the download on the tail plane must be:

A – increased
B – decreased
C – remain the same

Ref: AIR: atpl, cpl;

Ans: A

23489. In a glide the maximum range will be obtained by flying at:

A – Vne
B – a speed close to the stalling speed
C – Vmd
D – Vmo/Mmo

Ref: AIR: atpl, cpl;

Ans: C

23491. At a constant IAS, the radius of turn increases, the angle of bank has been:

A – increased
B – decreased
C – held constant

Ref: AIR: atpl, cpl;

Ans: B

23492. For an aircraft at high weight, the minimum possible radius of turn will be:

A – less than when at low weight
B – the same as when at a low weight
C – more than when at a low weight

Ref: AIR: atpl, cpl;

Ans: C

081-08-02 Asymmetric thrust

4109. VMCL can be limited by:

(i) engine failure on take-off
(ii) roll rate

A – (i) is incorrect; (ii) is correct
B – (i) is correct; (ii) is incorrect
C – (i) and (ii) are both correct
D – (i) and (ii) are incorrect

Ref: AIR: atpl, cpl;

Ans: A

4113. Which of the following statements is correct?

1. When the critical engine fails during take-off the speed VMCL can be limiting
ll. The speed VMCL can be limited by the available maximum roll rate

A – l is incorrect; ll is correct
B – l is correct; ll is correct
C – l is incorrect; ll is incorrect
D – l is correct; ll is incorrect

Ref: AIR: atpl, cpl;

Ans: A

4116. Why is VMCG determined with the nosewheel steering disconnected?

A – Because the nosewheel steering could become inoperative after an engine has failed
B – Because the value of VMCG must also be applicable on wet and/or slippery runways
C – Because it must be possible to abort the take-off even after the nosewheel has already been lifted off the ground
D – Because nosewheel steering has no effect on the value of VMCG

Ref: AIR: atpl, cpl;

Ans: B

21048. During the take-off roll with a strong crosswind from the left, a four engine jet aeroplane with wing mounted engines experiences an engine failure. The greatest control problem is caused by the loss of which engine?

A – The left inboard engine
B – The right outboard engine
C – The right inboard engine
D – The left outboard engine

Ref: AIR: atpl, cpl;

Ans: D

21053. For a given aeroplane which two main variables determine the value of VMCG?

A – Airport elevation and temperature
B – Engine thrust and rudder deflection
C – Air density and runway length
D – Engine thrut and gear position

Ref: AIR: atpl, cpl;

Ans: A

21141. VMCA is certified with a bank angle of not more than 5o towards the operating engine because:

A – the slip indicator at 5o bank (live engine low) is centred
B – at 5o bank (live engine low) sideslip is zero
C – more than 5o bank (live engine low) would not reduce VMCA
D – although more bank reduces VMCA, too much bank may lead to fin stall

Ref: AIR: atpl, cpl;

Ans: D

21168. Which of the following statements is correct?

l. VMCL is the minimum contro speed in the landing configuration
ll. The speed VMCL is always limited by maximum rudder deflection

A – l is incorrect; ii is correct
B – l is incorrect; ll is incorrect
C – l is correct; ll is correct
D – l is correct; ll is incorrect

Ref: AIR: atpl, cpl;

25750. What are the correct Sl units for density and force?

A – Kg/N, Nm3
B – N/m3, Kg
C – Kg/m3, Newtons
D – Kg/m3, Kg

Ref: HELI: atpl, cpl

Ans: C

25757. Subsonic flow over a cambered airfoil at 4o angle of attack will cause:

A – an increase in speed and drop in pressure over the upper surface and a decrease in speed and a rise in pressure over the lower surface
B – a decrease in speed and drop in pressure over the upper surface and a decrease in speed and a drop in pressure over the lower surface
C – an increase in speed and drop in pressure over the upper surface and an increase in speed and a drop in pressure over the lower surface
D – a decrease in speed and drop in pressure over the upper surface and an increase in speed and a drop in pressure over the lower surface

Ref: HELI: atpl, cpl

Ans: C

25760. Which of the following expressions could represent the relationship between force, mass and acceleration:

A – a = m/F
B – m = F x a
C – F = m x a
D – a = F x m

Ref: HELI: atpl, cpl

Ans: C

25761. A line connecting the leading and trailing edge midway between the upper and lower surface of a aerofoil. This definition is application for:

A – the mean aerodynamic chord line
B – the chord line
C – the camber line
D – the upper camber line

Ref: HELI: atpl, cpl

Ans: C

25774. How is the thickness of an aerofoil section measured?

A – As the ratio of wing angle
B – Related to camber
C – As the percentage of chord
D – In metres

Ref: HELI: atpl, cpl

Ans: C

25783. Which of the following is the most important result/problem caused by ice formation?

A – Increased drag
B – Increased weight
C – Blockage of the controls
D – Reduction in CLMAX

Ref: HELI: atpl, cpl

Ans: D

25784. What is the CL and CD ratio at normal angles of attack?

A – CL higher
B – CD higher
C – The same
D – CL much higher

Ref: HELI: atpl, cpl

Ans: D

25791. Cambered wing sections give ___ maximum CL at a relatively ___ angles of attack.

A – high; high
B – low; high
C – low; low
D – high; low

Ref: HELI: atpl, cpl

Ans: D

25819. If EAS is increased by a factor of 4, by what factor would profile drag increase?

A – 16
B – 12
C – 8
D – 4

Ref: HELI: atpl, cpl

Ans: A

25820. The induced drag coefficient, CDi is proportional with:

A – CL^2
B – CL
C – square root (CL)
D – Clmax

Ref: HELI: atpl, cpl

Ans: A

25822. At zero angle of attack in flight, a symmetrical wing section will produce:

A – some lift and drag
B – zero lift with some induced and profile drag
C – zero lift and drag
D – zero lift with some drag

Ref: HELI: atpl, cpl

Ans: D

25824. When considering an angle of attack versus coefficient of lift graph for a cambered aerofoil, where does the lift curve intersect the vertical CL axis?

A – Above the origin
B – Below the origin
C – At the point of origin
D – To the left of the origin

Ref: HELI: atpl, cpl

Ans: A

25860. As subsonic air flows through a convergent duct:
(i) static pressure
(ii) velocity

A – (i) increases and (ii) decreases
B – (i) increases and (ii) decreases
C – (i) decreases and (ii) decreases
D – (i) decreases and (ii) increases

Ref: HELI: atpl, cpl

Ans: D

25862. On an asymmetrical, single curve aerofoil, in subsonic airflow, at low angle of attack, when the angle of attack is increased, the centre of pressure will (assume a conventional transport aeroplane):

A – move forward
B – move aft
C – remain matching the airfoil aerodynamic centre
D – remain unaffected

Ref: HELI: atpl, cpl

Ans: A

25863. The point, where the aerodynamic lift acts on a wing is:

A – the c.g. location
B – the centre of pressure
C – the point of maximum thickness of the wing
D – the suction point of the wing

Ref: HELI: atpl, cpl

Ans: B

25864. Increasing dynamic (kinetic) pressure will have the following effect on the drag of an aeroplane (all other factors of importance remaining constant):

A – the drag decreases
B – this has no effect
C – the drag increases
D – the drag is only affected by the ground speed

Ref: HELI: atpl, cpl

Ans: C

25919. After the transition point between the laminar and turbulent boundary layer:

A – the mean speed increases and the friction drag decreases
B – the boundary layer gets thicker and the speed decreases
C – the mean speed and friction drag increases
D – the boundary layer gets thinner and the speed increases

Ref: HELI: atpl, cpl

Ans: C

25922. High Aspect Ratio, as compared with low Aspect Ratio, has the effect of:

A – increasing lift and drag
B – increasing induced drag and decreasing critical angle of attack
C – decreasing induced drag and critical angle of attack
D – increasing list and critical angle of attack

Ref: HELI: atpl, cpl

Ans: C

25924. What is the unit of measurement for power?

A – N/m
B – Nm/s
C – kgm/s2
D – Pa/m2

Ref: HELI: atpl, cpl

Ans: B

25927. The interference drag on an aerofoil are vertical respectively parallel to the:

A – separation of the induced vortex
B – the addition of induced and parasite drag
C – interaction between aeroplane parts (e.g. wing/fuselage)
D – downwash behind the wing

Ref: HELI: atpl, cpl

Ans: C

25988. Lift is generated when:

A – a certain mass of air is accelerated in its flow direction
B – the flow direction of a certain mass of air is changed
C – a symmetrical aerofoil is placed in a high velocity air stream at zero angle of attack
D – a certain mass of air is retarded

Ref: HELI: atpl, cpl

Ans: B

25993. The angle of attack of a aerofoil section is defined as the angle between:

A – The undisturbed airflow and the mean camberline
B – The local airflow and the mean camberline
C – The local airflow and the chordline
D – The undisturbed airflow and the chordline

Ref: HELI: atpl, cpl

Ans: D

25994. The angle of attack of an aerofoil section is the angle between the:

A – bottom surface and the chord line
B – bottom surface and the horizontal
C – bottom surface and the relative airflow
D – chord line and the relative undisturbed airflow

Ref: HELI: atpl, cpl

Ans: D

25995. The difference between IAS and TAS will:

A – increase with increasing air density
B – increase with decreasing temperature
C – decrease with decreasing altitude
D – decrease with increasing speed

Ref: HELI: atpl, cpl

Ans: C

26054. During flight with zero angle of attack, the pressure along the upper surface of a wing would be:

A – greater than atmospheric pressure
B – equal to atmospheric pressure
C – less than atmospheric pressure
D – always above Mcrit

Ref: HELI: atpl, cpl

Ans: C

26062. Effective angle of attack is the:

A – angle between the chord line and the mean direction of a non-uniform disturbed air stream
B – angle between the relative airflow and the chord line
C – angle between the chord line and the fuselage horizontal datum
D – angle between the fuselage horizontal datum and the chord line of the horizontal stabiliser

Ref: HELI: atpl, cpl

Ans: A

26063. The magnitude of a force is:

A – its direction of application
B – its largeness of size
C – the units in which it is normally measured
D – its vector

Ref: HELI: atpl, cpl

Ans: B

26065. In ISA the air temperature is considered to be:

A - -56.5 degrees C at 26.090ft
B - -56.5 degrees F at 36.500ft
C - -56.5 degrees C at 36.090ft
D – 56.5 degrees C at 36.090ft

Ref: HELI: atpl, cpl

Ans: C

26066. In ISA pressure decreases:

A – at a constant rate as altitude increases
B – at a rate of 1 milibar per 30ft at low altitudes
C – at a rate of 0.5 lb/in per 1000ft above 10000ft altitude
D – at a rateof 30 milibars per ft

Ref: HELI: atpl, cpl

Ans: B

26067. If an aircraft is descending at 500 ft/min from 5000 ft altitude, the rate of pressure increase outside the aircraft is:

A – greater than the rate of pressure increase outside an aircraft descending at 500 ft/min from 15000 ft to 10000 ft
B – less than the rate of pressure increase outside an aircraft descending at 500 ft/min from 15000 ft to 10000 ft
C – equal to the rate of pressure increase outside an aircraft descending at 5000 ft/min at any altitude
D – the rate of change will be the same

Ref: HELI: atpl, cpl

Ans: A

26069. An aerofoil which is producing lift will have:

A – upwash ahead of the wing and downwash behind it
B – upwash ahead of the wing but no deflection of the airflow behind it
C – no deflection of the airflow ahead of the wing but downwash behind it
D – no deflection of the airflow either ahead or behind the aerofoil

Ref: HELI: atpl, cpl

Ans: A

26080. The purpose of streamlining is:

A – to reduce form drag
B – to reduce induced drag
C – to increase lift
D – to reduce skin friction drag

Ref: HELI: atpl, cpl

Ans: A

26112. With a decrease in angle of attack:

A – the stagnation point moves forward
B – the separation point moves forward
C – form drag will increase
D – induced drag will increase

Ref: HELI: atpl, cpl

Ans: A

26128. To convert knots into miles per hour:

A – multiply the knots by 0.87
B – divide the knots by 0.87
C – multiply the knots by 0.87 and divie by the relative density
D – divide the knots by 8.7

Ref: HELI: atpl, cpl

Ans: B

26129. The aerodynamic centre is the point on the chord line where:

A – drag acts
B – the sum of all aerodynamic force acts
C – the geometric centre of the wing is located
D – the pitching moment remains constant throughout changes in angle of attack within the normal range

Ref: HELI: atpl, cpl

Ans: D

26132. The drag of an aircraft will:

A – increase with increase in air temperature
B – increase with decrease in air density
C – increase with increase in air pressure
D – decrease with an increase in stagnation pressure

Ref: HELI: atpl, cpl

Ans: C

26182. Vy is defined as:

A – speed for best rate of descent
B – speed for best angle of climb
C – speed for best rate of climb
D – maximum speed which should be used in a climb

Ref: HELI: atpl, cpl

Ans: C

26184. If air is assumed to be incompressible, this means:

A – there will be no change in pressure when the speed of the airflow is changed
B – there will be no change of density due to change of pressure
C – the density will only change with speed at supersonic speed
D – pressure changes will only occur at very high speeds

Ref: HELI: atpl, cpl

Ans: B

26185. A symmetrical aerofoil section of a wing is set at zero AOA will produce:

A – most of the lift on the upper surface
B – most of the lift on the lower surface
C – depends on the aircraft's speed
D – zero lift

Ref: HELI: atpl, cpl

Ans: D

26195. A line from the centre of curvature of the leading edge to the trailing edge, equidistant from the top and bottom wing surface is:

A – camber line
B – upper camber line
C – mean chord
D – mean aerodynamic chord

Ref: HELI: atpl, cpl

Ans: A

26198. Which of the following creates lift?

A – a slightly cambered aerofoil
B – an aerofoil in a high speed flow
C – air accelerated upwards
D – air accelerated downwards

Ref: HELI: atpl, cpl

Ans: D

26199. What is the Sl unit for density?

A – mV2
B – kg/cm2
C – kg-m
D – kg/m3

Ref: HELI: atpl, cpl

Ans: D

26201. Wing tip vortices are caused by unequal pressure distribution on the wing which results in airflow from:

A – bottom to top around the trailing edge
B – top to bottom around the trailing edge
C – bottom to top around the wingtip
D – top to bottom around the wingtip

Ref: HELI: atpl, cpl

Ans: C

26204. When considering the properties of a laminar an turbulent boundary layer, which of the following statements is correct?

A – friction drag is the same
B – friction drag higher in laminar
C – friction drag higher in turbulent
D – separation point is most forward with a turbulent layer

Ref: HELI: atpl, cpl

Ans: C

26205. Laminar flow has:

A – more friction than turbulent
B – same friction as turbulent
C – less friction than turbulent

Ref: HELI: atpl, cpl

Ans: C

26207. What do ‘S’ and ‘q’ represent in the lift equation?

A – static pressure and chord
B – wing span and dynamic pressure
C – wing area and dynamic pressure
D – wing area and static pressure

Ref: HELI: atpl, cpl

Ans: C

26208. Which of the following is the correct definition of aspect ratio?

A – span divided by tip chord
B – chord divided by span
C – span divided by mean chord
D – chord divided by span, measured at the 25% chord position

Ref: HELI: atpl, cpl

Ans: C

26211. Where does the airflow separation begin?

A – upper surface/towards the leading edge
B – lower surface/towards the trailing edge
C – upper surface/towards the trailing edge
D – lower surface/towards the leading edge

Ref: HELI: atpl, cpl

Ans: C

25454. If tail rotor blades are not allowed to flap the tail rotor will suffer from what?

A – Inflow roll
B – Flapback
C – Dissymmetry of rotor thrust
D – Airflow reversal

Ref: HELI: atpl, cpl

Ans: C

25455. As a helicopter is flared the ___ increases because ___ decreases:

A – Rrpm; rotor drag
B – Rrpm; angle of attack
C – rotor drag; rotor thrust
D – rotor drag; Nr

Ref: HELI: atpl, cpl

Ans: A

25456. In a free air hover how does Vi vary along the blade?

A – It is greater at the tip because of tip vortices
B – It is greater at the root because of the demarcation vortex
C – It is less at the tip because of tip vortices
D – it is less at the tip because of recirculation

Ref: HELI: atpl, cpl

Ans: C

25457. If a helicopter is positioned into wind and suffers from blade sailing where will the blade reach a maximum height?

A – At the back of the disc
B – Perpendicular to the airflow
C – On the advancing side
D – At the front of the disc

Ref: HELI: atpl, cpl

Ans: D

25464. Inflow roll is caused by:

A – The reduction of Vi differing across the disc
B – The reduction of Vi being greater at the front of the disc
C – The reduction of induced flow being uniform
D – The increase of induced flow differing across the disc

Ref: HELI: atpl, cpl

Ans: A

25466. The fuselage rotates around the point where the ___s acting and is known as ___

A – TRT; pendulosity
B – vertical component of TRT; flapback
C – horizontal components of TRT; pendulosity
D – rotor drag; flapback

Ref: HELI: atpl, cpl

Ans: C

25468. The risk causing damage by blade sailing can be reduced by:

A – Accelerating the rotors slower than normal
B – Positioning the helicopter downwind
C – Accelerating the rotors faster than normal
D – Positioning the helicopter into wind

Ref: HELI: atpl, cpl

Ans: C

25470. The blade velocity at the midway point on the retreating side is:

A – Vr + Vw
B – Vw – Vr
C – Vr – Vw
D – Vi + Vr

Ref: HELI: atpl, cpl

Ans: C

25495. If an object is statically unstable it will:

A – Move in the direction of the displacement
B – Stop moving
C – Return to the original position
D – Oscillate

Ref: HELI: atpl, cpl

Ans: A

25496. If the disc of a teetering head is tilted what will the blades do?

A – Tilt by flapping
B – Tilt by feathering
C – Remain at the preset coning angle
D – Cone upwards

Ref: HELI: atpl, cpl

Ans: C

25497. What are modern piston aero-engines constructed from?

A – Pressed steel
B – Stainless steel
C – Dense alloys
D – Lightweight alloy

Ref: HELI: atpl, cpl

Ans: D

25498. Power is:

A – KV2
B – KV3
C – KVV
D – V/CD

Ref: HELI: atpl, cpl

Ans: B

25539. To enable the rotor blades to rotate freely during an autorotation:

A – An intermediate gearbox is fitted to transfer the drive to the main rotor
B – A clutch is fitted between the engine and rotor drive unit
C – A semi-automatic gearbox is fitted between engine and rotor
D – A ‘free-wheeling’ unit is fitted between the engine and the rotor

Ref: HELI: atpl, cpl

Ans: D

25540. For a single-engined helicopter flying at low forward airspeeds, what altitude band should be avoided to ensure the helicopter can land sfety in the event of an engine failure:

A – In the band 15 – 200 feet
B – In the band 15 – 400 metres
C – In the band 15 – 400 feet
D – In the band 15 – 200 metres

Ref: HELI: atpl, cpl

Ans: C

25541. If when flying a helicopter a pilot accidentally finds themselves in a zero or negative “G” situation, the correct recovery technique is to:

A – Apply rearward cyclic to reload the rotor into positive “G” situation, then use cyclic to counteract the roll
B – Apply forward cyclic to remove the load on the rotor
C – Apply left cyclic to counteract the roll, whilst raising collective
D – Raise collective

Ref: HELI: atpl, cpl

Ans: A

25542. What effect does a headwind have on the rate of climb and the angle of climb of a helicopter:

A – rate of climb – increases; angle of climb – steeper
B – rate of climb – remains steady; angle of climb – steeper
C – rate of climb – reduces; angle of climb – remains the same
D – rate of climb – increases; angle of climb – shallower

Ref: HELI: atpl, cpl

Ans: B