Performance

Performance Class B - Single Engine

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Performance Class B - Single Engine

Definitions of terms and speeds used

The scheduled landing distance required is the distance:

A) From a screen of a designated height to the point at which the aircraft has come to a complete stop
B) From touchdown to the point at which the aircraft has come to a complete stop
C) From touchdown to the point at which the aircraft has decelerated to a speed of 20kts
D) From the point at which the aircraft is 50 metres above the runway to the point at which the aircraft has come to a complete stop

Which of the following statements is correct?

A) Gross acceleration is net acceleration minus 9.81m/s2
B) Gross landing distance is greater than net landing distance
C) Gross gradient is less than net gradient
D) Gross take-off distance is less than net take-off distance

VLO is defined as:

A) The maximum speed for landing gear operation
B) Minimum possible speed that the aircraft could lift off the ground
C) Actual speed that the aircraft lifts off the ground
D) The long range cruise speed

The speed VS is defined as

A) speed for best specific range
B) design stress speed
C) stalling speed or minimum steady flight speed at which the aeroplane is controllable
D) safety speed for take-off in case of a contaminated runway

The rate of climb:

A) Is the horizontal component of the true airspeed
B) Is approximately climb gradient times true airspeed divided by 100
C) Is angle of climb times true airspeed
D) Is the downhill component of the true airspeed

Gross performance is:

A) The minimum performance which a fleet of aeroplanes should achieve if satisfactorily maintained and flown in accordance with the techniques described in the manual
B) 65 percent of net performance
C) The average performance which a fleet of aeroplanes should achieve if satisfactorily maintained and flown in accordance with the techniques described in the manual
D) The maximum performance which a fleet of aeroplanes should achieve if satisfactorily maintained and flown in accordance with the techniques described in the manual

4mm of rain is covering a runway. The runway is:

A) Flooded
B) Contaminated
C) Damp
D) Wet

Density altitude is the:

A) Height above the surface
B) Pressure altitude corrected for 'non standard' temperature
C) Altitude reference to the standard datum plane
D) Altitude read directly from the altimeter

Under what condition is pressure altitude and density altitude the same value?

A) At standard temperature
B) When the altimeter setting is 1013" Hg
C) When the altimeter setting is 29.92" Hg
D) When indicated, and pressure altitudes are the same value on the altimeter

Pressure altitude is:

A) The altimeter indication when QFE is set on the sub-scale
B) The altimeter indication when 1013.25 Hpa is set on the sub-scale
C) The altitude above sea level
D) The altimeter indication when QNH is set on the sub-scale

The 'climb gradient' is defined as the ratio of:

A) The increase of altitude to horizontal air distance expressed as a percentage
B) The increase of altitude to distance over ground expressed as a percentage
C) Rate of climb to true airspeed
D) True airspeed to rate of climb

Which of the equations below expresses approximately the un-accelerated percentage climb gradient for small climb angles?

A) Cimb Gradient = (Lift/Weight) x 100
B) Climb Gradient = ((Thrust + Drag)/Lift) x 100
C) Climb Gradient = ((Thrust - Drag)/Weight) x 100
D) Climb Gradient = ((Thrust - Mass)/Lift) x 100

The stalling speed or the minimum steady flight speed at which the aeroplane is controllable in landing configuration is abbreviated as

A) VS1
B) VSO
C) VMC
D) VS

What are the standard temperature and pressure values at sea level?

A) 0 degrees Celsius and 1013 hPa
B) 59 degrees Fahrenheit and 29.92 millibars
C) 15 degrees Celsius and 1013.25 hPa
D) 59 degrees Celsius and 1013.2 millibars

The coefficient of lift can be increased either by flap extension or by

A) increasing the CAS
B) increasing the angle of attack
C) decreasing the 'nose-up' elevator trim setting
D) increasing the TAS

The absolute ceiling is defined as:

A) The outer boundary of our galaxy
B) The altitude where the maximum rate of climb is 0 ft/minute
C) The altitude where the rate of climb is maximum
D) The altitude where a certain maximum rate of climb (e.g. 100 ft/min) is attained

Regarding take-off, the take-off decision speed V1:

A) Is an airspeed at which the aeroplane is airborne but below 35 ft and the pilot is assumed to have made a decision to continue or discontinue the take-off
B) Is the airspeed on the ground at which the pilot is assumed to have made a decision to continue or discontinue the take-off
C) Is always equal to VEF (Engine Failure speed)
D) Is the airspeed of the aeroplane upon reaching 35 feet above the take-off surface

For a single engine class B aeroplane, V2 may not be less than:

A) 1.15Vs
B) 1.2Vs
C) not applicable
D) 1.5Vs

What are the standard temperature and pressure values for sea level?

A) 59° C and 1013.2 millibars
B) 0° C and 1013.2 bar
C) 59° F and 29.92 millibars
D) 15° C and 29.92" Hg

The C of G is:

A) The point on the aircraft through which gravity appears to act
B) The point on the aircraft where the lift acts through
C) The point on the aircraft from where the dihedral angle is measured
D) The point on the aircraft where the datum is located

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21. Take-off distance available is:

A) TORA
B) the distance from brake release point to 35ft screen height
C) TORA plus clearway
D) TORA plus stopway

The load factor in a turn in level flight with constant TAS depends on:

A) the true airspeed and the bank angle
B) the radius of the turn and the weight of the aeroplane
C) the radius of the turn and the bank angle
D) the bank angle only

The gross take off distance required for a single engine Class B aircraft is the distance:

A) from the start of the run to a screen height of 35 feet
B) from the start of the run to a screen height of 50 feet
C) from the start of the run to the point at which the wheels are just clear of the ground multiplied by a factor of 1.25
D) from the start of the run to the point at which the wheels are just clear of the ground

The Density Altitude:

A) is used to establish minimum clearance of 2.000 feet over mountains
B) is used to determine the aeroplane performance
C) is equal to the pressure altitude
D) is used to calculate the FL above the Transition Altitude

The point where Drag coefficient/Lift coefficient is a minimum is:

A) On the " back side" of the drag curve
B) The lowest point of the drag curve
C) At stalling speed (VS)
D) The point where a tangent from the origin touches the drag curve

For a piston engine aircraft the Critical Altitude is:

A) The maximum altitude at which, in standard atmosphere, it is possible to maintain a specified power or a specified manifold pressure

B) The maximum altitude at which it is possible to maintain a specified manifold pressure

C) The minimum altitude at which, in standard atmosphere, it is possible to maintain a specified power or a specified manifold pressure

D) The maximum altitude at which it is possible to maintain a specified power

Total air temperature is defined as:

A) The static air temperature plus adiabatic compression rise

B) The static air temperature plus isobaric compression rise

C) The highest temperature in a specified volume

D) The static air temperature plus isothermal compression rise

The International Standard Atmosphere defines an atmosphere where Sea level temperature (i) Sea level pressure (ii) Sea level density (iii) temperature lapse rate (iv) are:

A) (i) 15° C (ii) 1013 mb (iii) 1.225 kg/m3 (iv) 1.98° C/1000m

B) (i) 15° C (ii) 29.92 in.Hg (iii) 1013 kg/m3 (iv) 1.98° C/1000 ft

C) (i) 15° C (ii) 1013 mb (iii) 1.225 kg/m3 (iv) 6.5° C/1000 m

D) (i) 0° C (ii) 1.013 Bar (iii) 1225 g/m3 (iv) 1.98° C/1000 ft

Take off and landing performance:

Which of the following statements is correct?

A) Landing distance required on a grass runway will be shorter than on tarmac because of the rougher surface
B) Deployment of lift dumpers will increase the effectiveness of the wheel brakes
C) A reduced flap setting for landing will give a shorter landing distance, as a result of reduced lift and greater load on the wheels
D) Wheel braking is most effective when the wheels are locked

The two requirements for take-off with which compliance is necessary are (single engine class B):

A) field length and brake energy requirements
B) field-length and climb gradient requirements
C) tyre speed and brake energy requirements
D) obstacle and climb gradient requirements

Decreasing take off flap from 15° to 0° will probably result in a _____ Vlof.

A) reduced
B) greatly reduced
C) increased
D) unchanged

(For this Question use CAP 698 Figure 2-4)
Accounting for the following, what would be the minimum required head wind component for landing? Use the attached chart.
Factored landing distance: 1300 ft
Temperature at MSL: ISA
Landing mass: 3200 lbs

A) 10 Kts
B) 0 Kts
C) 15 Kts
D) 5 Kts

The effect of a decrease in air density is to:

A) decrease the take-off distance and reduce the rate of climb
B) increase the take-off distance and increase the rate of climb
C) increase the take-off distance and reduce the rate of climb
D) decrease the take-off distance and increase the rate of climb

At the moment of lift off:

A) rolling resistance is a maximum
B) lift is greater than mass
C) lift is equal to weight
D) lift and drag are equal to zero

The landing distance required must not exceed (single engine class B):
A) 60 percent of the landing distance available at destination and alternate aerodromes
B) 70 percent of the landing distance available at a destination aerodrome, and 60 percent of the landing distance available at an alternate aerodrome
C) 60 percent of the landing distance available at a destination aerodrome, and 70 percent of the landing distance available at an alternate aerodrome
D) 70 percent of the landing distance available at destination and alternate aerodromes

An upward runway slope:
A) decreases the take-off distance required
B) decreases the accelerated-stop-distance available
C) increases the take-off distance required
D) increases the accelerated-stop-distance available

Which of the following combinations will produce the best take-off performance in a normal atmosphere?
A) High altitude, high ambient temperature
B) High altitude, low ambient temperature
C) Low altitude, high ambient temperature
D) Low altitude, low ambient temperature

(Refer to CAP 698 figure 2-4)
With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft. Given :
O.A.T: ISA +15° C
Pressure Altitude: 0 ft
Aeroplane Mass: 2940 lbs
Tailwind component: 10 kt
Flaps: Landing position (down)
Runway: Tarred and Dry
A) approximately: 750 feet
B) approximately: 1400 feet
C) approximately: 950 feet
D) approximately: 1300 feet

(For this Question use CAP 698 Figure 2.2)
With regard to the take off performance chart for the single engine aeroplane determine the take off speed for (1) rotation and (2) at a height of 50 ft.
Given:
O.A.T: ISA+10° C
Pressure Altitude: 5000 ft
Aeroplane mass: 3400 lbs
Headwind component: 5 kt
Flaps: up
Runway: Tarred and Dry
A) 68 and 78 KIAS
B) 73 and 84 KIAS
C) 65 and 75 KIAS
D) 71 and 82 KIAS

If a runway is wet, the landing distance required for a dry runway (single engine class B):
A) may be used un-factored
B) must be increased by 15 percent
C) must be increased by 5 percent
D) must be increased by 50 percent

What is the effect of flap extension on Vx and Vy?
A) Vx increases and Vy decreases
B) Vx increases and Vy increases
C) Vx decreases and Vy increases
D) Vx decreases and Vy decreases

For a single engine class B aeroplane, take-off distance should be increased by... percent for each... percent upslope.
A) 1, 2
B) 3, 1
C) 2, 5
D) 5, 1

How does the thrust of fixed propeller vary during take-off run? The thrust
A) has no change during take-off and climb
B) decreases slightly while the aeroplane speed builds up
C) varies with mass changes only
D) increases slightly while the aeroplane speed builds up

Compared to still air conditions, if an aircraft takes off with a headwind:
A) clearance of obstacles will be increased and the MAT limit mass will not be affected
B) clearance of obstacles will not be affected and the MAT limit mass will not be affected
C) clearance of obstacles will not be affected and the MAT limit mass will increase
D) clearance of obstacles will be increased and the MAT limit mass will be increased

What is the effect of an increased flap angle on the optimum lift-to-drag ratio?
A) None
B) The optimum lift-to-drag ratio will decrease
C) The optimum lift-to-drag ratio will decrease initially, but will increase at higher flap settings
D) The optimum lift-to-drag ratio will increase

For an aeroplane nn Performance Class B the net take-off flight path begins at a height of _____ and ends at a height of _____ .
A) 35 feet; 1500 feet
B) 50 feet; 1000 feet
C) 50 feet; 1500 feet
D) 35 feet; 1000 feet

For an aeroplane in Performance Class B the following factors must be applied in determining the take off distance from dry grass and wet pavement respectively:
A) 1.2 & 1.15
B) 1.3 & 1.2
C) 1.3 & 1.15
D) 1.2 & 1.0

(For this Question use CAP 698 Figure 2.4)
With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft.

Given:

O.A.T: ISA
Pressure Altitude: 1000 ft
Aeroplane Mass: 3500 lbs
Tailwind component: 5 kt
Flaps: Landing position (down)
Runway: Tarred and Dry
A) 920 feet
B) 1700 feet
C) 1150 feet
D) 1500 feet

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21. Runway 30 is in use and the threshold elevation is 2139 feet, threshold elevation of runway 12 is 2289 feet.
Take-off run available is 1720 metres and clearway is 280 metres. What is the slope of the runway in use?
A) 1.49% uphill
B) 2.53% per minute
C) 2.65% uphill
D) 1.86% downhill

If the flap angle is reduced below the optimum take-off setting, the field limited take-off mass... and the climb gradient limited mass...
A) decreases, decreases
B) increases, decreases
C) increases, increases
D) decreases, increases

With the flaps in the take-off position, compared to the clean configuration, the climb gradient... and the speed for best climb angle...
A) decreases, increases
B) increases, decreases
C) decreases, decreases
D) increases, increases

(For this Question use CAP698 Figure 2.4)
With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft.

Given:
O.A.T: ISA +15° C
Pressure Altitude: 0 ft
Aeroplane Mass: 2940 lbs
Headwind component: 10 kt
Flaps: Landing position (down)
Runway: short and wet grass- firm soil
Correction factor (wet grass): 1.38

A) 1794 feet
B) 2000 feet
C) 1450 feet
D) 1300 feet

(For this question use CAP 698 Figure 2.4)
With regard to the graph for landing performance, what is the minimum headwind component required in order to land at Helgoland airport?

Given:
Runway length: 1300 ft
Runway elevation: MSL
Weather: assume ISA conditions
Mass: 3200 lbs
Obstacle height: 50 ft

A) 10 kts
B) No wind
C) 5 kt
D) 15 kts

(For this Question use CAP 698 Figure 2.2)
With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft.

Given:
O.A.T: 38° C
Pressure Altitude: 4000 ft
Aeroplane Mass: 3400 lbs
Tailwind component: 5 kt
Flaps: Approach setting
Runway: Dry Grass
Correction factor: 1.2

A) 4200 ft
B) 3960 ft
C) 5040 ft
D) 3680 ft

A decrease in atmospheric pressure has, among other things, the following consequences on take-off performance:

A) A reduced take-off distance and degraded initial climb performance
B) An increased take-off distance and degraded initial climb performance
C) A reduced take-off distance and improved initial climb performance
D) An increased take-off distance and improved initial climb performance

(For this Question use CAP 698 Figure 2.2)
With regard to the take off performance chart for the single engine aeroplane determine the take off distance over a 50 ft obstacle height.
Given:
O.A.T: 30° C
Pressure Altitude: 1000 ft
Aeroplane Mass: 2950 lbs
Tailwind component: 5 kt
Flaps: Approach setting
Runway: Short, wet grass, firm subsoil
Correction factor: 1.25 (for runway conditions)

A) 1900 ft
B) 2000 ft
C) 2375 ft
D) 1600 ft

The effect of increased weight on a glide descent in a normal atmosphere is:

A) Forward speed increases, rate of descent decreases
B) Forward speed decreased, rate of descent increases
C) Forward speed decreased, rate of descent decreases
D) Forward speed increases, rate of descent increases

For a grass runway, the landing distance required for a paved runway should be (Class B single engine):

A) increased by 15%
B) increased by 20%
C) increased by 5%
D) decreased by 5%

Given that the control requirement is met, the speed at the 50ft. screen must not be less than (single engine class B):

A) 30 percent above the stalling speed with flaps up
B) 20 percent above the stalling speed with landing flaps
C) 50 percent above the stalling speed with flaps up
D) 30 percent above the stalling speed with landing flaps

The maximum angle of bank permitted after take-off below 50 feet for an aeroplane in Performance Class B is:

A) 0°
B) 5°
C) 15°
D) 10°

(For this Question use CAP 698 Figure 2-4)
With regard to the landing performance chart for the single engine aeroplane determine the following speeds:

1. at a height of 50 ft in clean configuration
2. touchdown speed

Given:
O.A.T: +8° C
Pressure Altitude: 4000 ft
Aeroplane mass: 2530 lbs
Headwind component: 15 kt
Flaps: up
Runway: Tarred and Dry

A) (1) 82 KIAS (2) 73 KIAS
B) (1) 68 KIAS (2) 73 KIAS
C) (1) 82 KIAS (2) 60.5 KIAS
D) (1) 68 KIAS (2) 60.5 KIAS

(Refer to CAP 698 figure 2-1)
With regard to the take off performance chart for the single engine aeroplane determine the maximum allowable take off mass. Given:
O.A.T: ISA
Pressure Altitude: 4000 ft
Headwind component: 5 kt
Flaps: up
Runway: Tarred and Dry
Factored runway length: 2000 ft
Obstacle height: 50 ft

A) 3000 lbs
B) 3650 lbs
C) 3240 lbs
D) 2900 lbs

(Refer to CAP 698 figures 2-1 & 2-2)
With regard to the take-off performance chart for the single engine aeroplane determine the take-off distance required to 50 ft:
Given:
O.A.T: -7° C
Pressure Altitude: 7000 ft
Aeroplane mass: 2950 lbs
Headwind component: 5 kt
Flaps: 10°
Runway: Tarred and Dry

A) approximately 840 m
B) approximately 700 m
C) approximately 1220 m
D) approximately 500 m

(For this Question use CAP 698 Figure 2.4)
Using the Landing Diagram, for single engine aeroplane, determine the landing distance (from a screen height of 50 ft) required, in the following conditions.
Given:
Pressure altitude: 4000 ft
OAT: 5° C
Aeroplane mass: 3530 lbs
Headwind component: 15 kt
Flaps: Approach setting
Runway: tarred and dry
Landing gear: down
A) 1020 ft
B) 1550 ft
C) 880 ft
D) 1400 ft

(CAP 698 figure 2.4)
Determine the gross landing distance required for the following conditions:
Pressure altitude: 4000ft
Temperature: ISA
Landing weight: 3600lb
Reported wind component: 0kts
Runway slope: 1 percent downhill
A) 1050 ft
B) 1600 ft
C) 1100 ft
D) 1680 ft

Other factors being equal , an increase in take-off weight will
A) increase lift off speed and stalling speed remains
B) weight has no effect on take-off speed or lift-off speed
C) increase lift off and stalling speed
D) increase lift off speed and decrease stalling speed

(For this Question use CAP 698 Figure 2.2)
With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft.
Given:
O.A.T: 30° C
Pressure Altitude: 1000 ft
Aeroplane Mass: 3450 lbs
Tailwind component: 2.5 kt
Flaps: up
Runway: Tarred and Dry
A) 2200 feet
B) 2470 feet
C) 2800 feet
D) 1440 feet

Consider the field length requirements for a class B aircraft where no stopway or clearway is available. In this case, the take-off distance must not exceed:

A) 1.25 x TODA
B) 1.15 x TODA
C) 1.15 x TORA
D) 1.25 x TORA

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41. (CAP 698 Figure 2.1)

Find the gross take-off distance required for the following conditions:
Pressure altitude: 2000ft
Outside air temperature: 25° C
Weight: 3300 lb
Reported headwind: 10 kt
Runway: level, Paved dry surface

A) 2550 ft
B) 2000 ft
C) 1600 ft
D) 950 ft

An increase in atmospheric pressure has, among other things, the following consequences on take-off performance:

A) an increased take-off distance and improved initial climb performance
B) a reduced take-off distance and improved initial climb performance
C) an increases take-off distance and degraded initial climb performance
D) a reduced take-off distance and degraded initial climb performance

(For this Question use CAP 698 Figure 2.4)
With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft.
Given:
O.A.T: 0° C
Pressure Altitude: 1000 ft
Aeroplane Mass: 3500 lbs
Tailwind component: 5 kt
Flaps: Landing position (down)
Runway: Tarred and Dry

A) 1150 feet
B) 1480 feet
C) 1650 feet
D) 940

The forces acting on an aircraft during the take-off run are:

A) lift, weight, aerodynamic drag, thrust and mechanical friction
B) lift, thrust and aerodynamic drag
C) weight, thrust and drag
D) lift, weight, aerodynamic drag and thrust

(Refer to CAP 698 Figure 2.1)
The following conditions apply to a take off aerodrome:
Pressure altitude: 6000 ft
Temperature: 8° C
Reported wind: 10 kt head
Runway slope: level
Runway length: 2800 ft with 500 ft of stopway and 500 ft of clearway
The maximum permissible weight for take off would be:

A) 3400 lb
B) 3300 lb
C) 2900 lb
D) 3600 lb

To obtain the optimum descent distance the TAS must:

A) Be decreased in a head wind
B) Be decreased only for a constant IAS descent in a head wind
C) Remain the same regardless of the wind component
D) Be increased in a head wind

For a single engine class B aeroplane, if there is no clearway or stopway, the gross take-off distance should be multiplied by:

A) 1.3
B) 1.15
C) 1.2
D) 1.25

(For this Question use CAP 698 Figure 2.2)
With regard to the take off performance chart for the single engine aeroplane determine the take off distance to a height of 50 ft.
Given:
O.A.T: -7° C
Pressure Altitude: 7000 ft
Aeroplane Mass: 2950 lbs
Headwind component: 5 kt
Flaps: Approach setting
Runway: Tarred and Dry

A) 1260 ft
B) 2450 ft
C) 1150 ft
D) 2050 ft

The landing distance required will be increased as a result of all of the following:

A) increased temperature, increased pressure altitude, uphill runway slope
B) increased temperature, decreased pressure altitude, downhill runway slope
C) decreased temperature, decreased pressure altitude, uphill runway slope
D) increased temperature, increased pressure altitude, downhill runway slope

What percentages of the headwind and tailwind components are taken into account when calculating the take- off field length required?

A) 50% headwind and 150% tailwind
B) 100% headwind and 100% tailwind
C) 50% headwind and 100% tailwind
D) 150% headwind and 50% tailwind

Descending at a constant IAS the gradient of descent in a normal atmosphere will:

A) Decrease progressively
B) Remain unchanged
C) Decrease in a head wind
D) Increase progressively

(CAP 698 figure 2.1)
What is the maximum permissible take-off weight to comply with the regulations for the following conditions:
Pressure altitude: 4000 ft
Temperature: 0° C
Reported wind: 15kts head
Runway slope: level
Runway length: 2500 ft, with no clearway or stopway

A) 2800 lbs
B) 3650 lbs
C) 3380 lbs
D) 3040 lbs

Which of the following will probably result in the greatest increase in take-off distance?

A) Tailwind; downslope; high surface temperature
B) Headwind; downslope; high surface temperature
C) Headwind; downslope; low surface temperature
D) Tailwind; upslope; high surface temperature

Which of the following statements is true (single engine class B)?

A) If the runway has an uphill slope of 1 percent, the landing distance required should be decreased by 5 percent
B) The landing distance required is not affected by weight as the effect of the increased speed is cancelled by the increased braking effect
C) The landing distance required is not affected by temperature
D) For planning purposes the landing distance required should be based on the ISA temperature appropriate to the pressure altitude

What happens to the field limited take off mass with runway slope?

A) It increases with an uphill slope
B) It increases with a downhill slope
C) It decreases with a downhill slope
D) It is unaffected by runway slope

If for aeroplane in Performance Class B the intended take-off flight path requires track changes of more than 15° , with the pilot unable to maintain visual navigation accuracy according to Appendix 1 of JAR OPS, the clearance of obstacles within _____ of track need be considered.

A) 500 m
B) 900 m
C) 300 m
D) 600 m

When landing on a dry paved runway (class B performance aircraft) with a downhill slope of 2 percent, what factorisation must be used?

A) 1.2
B) 1.3
C) 1.4
D) 1.1

If there is an increase in atmospheric pressure and all other factors remain constant, it should result in:

A) decreased take off distance and increased climb performance
B) decreased take off distance and decreased climb performance
C) increased take off distance and decreased climb performance
D) increased take off distance and increased climb performance

What is the effect of an increased flap setting on VDmin (minimum drag speed)?

A) None
B) VDmin decreases
C) VDmin increases
D) VDmin decreases first, but increases at the higher flap settings

The effect of increasing aircraft mass on the landing distance is:

A) screen speed increases, brake drag decreases, landing distance increases
B) screen speed increases, brake drag increases, landing distance increases
C) screen speed decreases, brake drag increases, landing distance decreases
D) screen speed decreases, brake drag decreases, landing distance decreases

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61. To determine the landing distance required (Class B single engine):

A) the reported wind components do not have to be factored
B) the reported headwind component must be factored by 1.5 and the reported tailwind component by 0.5
C) the reported headwind component must be factored by 0.5 and the reported tailwind component by 1.5
D) the reported wind components must be factored by 1.5

Descending at a constant IAS and a constant gradient of descent, the pitch angle must be:

A) Progressively decreased
B) Increase rapidly
C) Kept constant
D) Progressively increased

Take-off performance data, for the ambient conditions, show the following limitations with flap 10° selected:
Runway limit: 5 270 kg
Obstacle limit: 4 630 kg
Estimated take-off mass is 5 000kg
Considering a take-off with flaps at:

A) 20° , the obstacle limit is increased but the runway limit decreases
B) 5° , the obstacle limit is increased but the runway limit decreases
C) 20° , both limitations are increased
D) 5° , both limitations are increased

(Refer to CAP698 figure 2-1)
An extract of the flight manual of a single engine propeller aircraft is reproduced in the diagram.
Airport characteristics: hard, dry and zero slope runway
Actual conditions are:
Pressure Altitude: 1 500 ft
Outside Temperature: +18 ° C
Wind Component: 4 knots tailwind

For a take-off mass of 1 270 kg, the take-off distance will be:

A) 440 m
B) 525 m
C) 615 m
D) 415 m

Given that control requirements are adequate, the speed at the screen must not be less than (single engine class B):

A) 20 percent above the stall speed
B) 10 percent above the stall speed
C) 30 percent above the stall speed
D) 25 percent above the stall speed

Which airspeed provides the greatest gain in altitude in the shortest distance during climb after takeoff?

A) Vx
B) Vy
C) Va
D) Vc

An increase in atmospheric pressure has, among other things, the following consequences on landing performance:

A) An increased landing distance and improved go-around performance
B) An increased landing distance and degraded go-around performance
C) A reduced landing distance and degraded go around performance
D) A reduced landing distance and improved go-around performance

Which of the following combinations will give the most limiting takeoff weight if identical slope and wind component values exist?

A) A down-sloping runway with a headwind component
B) An up-sloping runway with a tailwind component
C) An up-sloping runway with a headwind component
D) A down-sloping runway with a tailwind component

(For this Question use CAP698 Figure 2.4)
With regard to the landing chart for the single engine aeroplane determine the landing distance from a height of 50 ft.
Given:
O.A.T: 27 ° C
Pressure Altitude: 3000 ft
Aeroplane Mass: 2900 lbs
Tailwind component: 5 kt
Flaps: Landing position (down)
Runway: Tarred and Dry

A) 1700 feet
B) 1850 feet
C) 1370 feet
D) 1120 feet

(Refer to CAP 698 SEP figure 2.4)
If the landing distance required from 50ft for the prevailing conditions is 900ft, the ground roll would be:

A) 500 ft
B) 600 ft
C) 800 ft
D) 750 ft

Climbing and cruise performance:

How does a headwind affect the speed to fly at in a descent?

A) The TAS should be decreased
B) The speed only increases with weight
C) The speed is not affected
D) The TAS should be increased

Any acceleration in climb, with a constant power setting:

A) improves the climb gradient if the airspeed is below VX
B) improves the rate of climb if the airspeed is below VY
C) decreases rate of climb and increase angle of climb
D) decreases the rate of climb and the angle of climb

If the speed brakes are extended during the descent while maintaining a constant speed, the rate of descent... and the angle of descent will...

A) increases, decrease
B) remains the same, increase
C) increases, remain the same
D) increases, increase

To maintain the same angle of attack and altitude at a higher gross weight an aeroplane needs:

A) less airspeed and same power
B) more airspeed and more power
C) more airspeed and less power
D) same airspeed

What will happen to VX and VY if the landing gear is extended?

A) VX decreases and VY increases
B) VX increases, VY decreases
C) VX and VY decrease
D) VX and VY increase

An aeroplane is climbing at a speed 10 KTS lower than the speed for best rate of climb:

A) Angle of climb will increase
B) Angle of climb will not change
C) Angle of climb will decrease
D) Rate of climb will not change

Compared to Vx and Vy in clean configuration, Vx and Vy in configuration with flaps extended will be:

A) Vx higher and Vy lower
B) Lower
C) Higher
D) Same

When flying an aircraft on the back of the drag curve, maintaining a slower speed (but still faster than VS) would require:

A) more thrust
B) less thrust due to less parasite drag
C) no change
D) more flap

When comparing Vx to Vy:

A) Vy will always be greater than or equal to Vx
B) Vx will always be greater than Vy
C) Vx will sometimes be greater than Vy, but sometimes be less than Vy
D) Vy will always be greater than Vx

If the mass of an aircraft is increased:

A) The range is reduced and the altitude for maximum range is higher
B) The range is reduced and the altitude for maximum range is lower
C) The range is increased and the altitude for maximum range is higher
D) The range is increased and the altitude for maximum range is lower

On a reciprocating engine aeroplane, with increasing altitude at constant gross mass, angle of attack and configuration the drag:

A) decreases and the CAS decreases too because of the lower air density
B) remains unchanged but the TAS increases
C) remains unchanged but the CAS increases
D) increases at constant TAS

In a given configuration the endurance of a piston engine aeroplane only depends on:

A) speed, mass and fuel on board
B) altitude, speed and mass
C) speed and mass
D) altitude, speed, mass and fuel on board

In un-accelerated climb

A) lift is greater than the gross weight
B) thrust equals drag plus the downhill component of the gross weight in the flight path direction
C) thrust equals drag plus the uphill component of the gross weight in the flight path direction
D) lift equals weight plus the vertical component of the drag

Which airspeed provides the greatest gain in altitude in the shortest distance during climb?

A) Va
B) Vy
C) Vne
D) Vx

What is density altitude?

A) The height above the standard datum plane
B) The altitude read from the altimeter when set to 1013hPa
C) The pressure altitude corrected for non-standard temperature
D) The same as temperature altitude

How does the best angle of climb and best rate of climb vary with increasing altitude?

A) Both increase
B) Both decrease
C) Best angle of climb decreases while best rate of climb increases
D) Best angle of climb increases while best rate of climb decreases

Which of the following combinations requires the least power for level flight?

A) Low altitude, 10° flap
B) High altitude, 0° flap
C) High altitude, 10° flap
D) Low altitude, 0° flap

On a reciprocating engine aeroplane, to maintain a given angle of attack, configuration and altitude at higher gross mass:

A) The airspeed will be decreased and the drag increased
B) The airspeed will be increased but the drag does not change
C) The airspeed and the drag will be increased
D) The lift/drag ratio must be increased

Other factors remaining constant, how does increasing altitude affect Vx and Vy:

A) Both will remain the same
B) Vx will decrease and Vy will increase
C) Both will increase
D) Both will decrease

In which of the flight conditions listed below is the thrust required (Tr) equal to the drag (D)?

A) In a climb with constant IAS
B) In a descent with constant TAS
C) In accelerated level flight
D) In level flight with constant IAS

---

21. Which force compensates the weight in un-accelerated straight and level flight?

A) the thrust
B) the drag
C) the resultant from lift and drag
D) the lift

When an aircraft reaches its service ceiling:

A) The lift will be insufficient to support the weight
B) It will have a small positive rate of climb
C) The excess power will be zero
D) The rate of climb will be zero

(For this Question use CAP 698 Figure 2.3)
Using the climb performance chart, for the single engine aeroplane, determine the ground distance to reach a height of 2000 ft above the reference zero in the following conditions:
Given:

O.A.T. at take-off: 25° C
Airport pressure altitude: 1000 ft
Aeroplane mass: 3600 lbs
Speed: 100 KIAS
Wind component: 15 kts Headwind

A) 24 637 ft
B) 18 347 ft
C) 21 505 ft
D) 18 832 ft

For a jet aircraft, the speed to give the maximum rate of climb will be:

A) the speed corresponding to the minimum drag coefficient
B) a speed greater than that for maximum lift-to-drag ratio
C) the speed corresponding to the maximum lift-to-drag ratio
D) a speed less than that for maximum lift-to-drag ratio

With which conditions would the aircraft need to be flown, in order to achieve maximum speed?

A) Maximum thrust and maximum drag
B) Thrust set for minimum drag
C) Best lift - drag ratio
D) Maximum thrust and minimum drag

What factors affect the descent angle in a glide?

A) Configuration and angle of attack
B) Mass and altitude
C) Mass and configuration
D) Configuration and altitude

To obtain the maximum possible range when flying into a headwind, the speed should be:

A) the same as the optimum speed in still air
B) increased by the magnitude of the wind speed
C) lower than the optimum speed for still air
D) higher than the optimum speed for still air

Assuming that the required lift exists, which forces determine an aeroplane's angle of climb?

A) Thrust and drag only
B) Weight and thrust only
C) Weight, drag and thrust
D) Weight and drag only

What is the most important aspect of the 'backside of the power curve'?

A) The aeroplane will not stall
B) The elevator must be pulled to lower the nose
C) The altitude cannot be maintained
D) The speed is unstable

With regard to a un-accelerated horizontal flight, which of the following statement is correct?

A) The minimum drag is a function of the pressure altitude
B) The minimum drag is independent of the aircraft mass
C) The minimum drag is a function of the density altitude
D) The minimum drag is proportional to the aircraft mass

As speed is reduced from Vmd to Vmp :

A) power required increases, drag decreases
B) power required decreases, drag increases
C) power required increases, drag increases
D) power required decreases, drag decreases

When flying at the best angle of climb speed:

A) an aeroplane will be flying at a higher airspeed than when flying at the best rate of climb speed
B) a specific altitude can be reached in the shortest time
C) a propeller driven aeroplane will be flying at minimum power speed
D) a specific altitude can be reached in the shortest distance

At sea level ISA an aircraft has a rate of climb of 650 ft/min at an indicated air speed of 85 KTS. The climb gradient in still air is:

A) 7.5%
B) 13%
C) 0.75%
D) 1.3%

The rate of climb depends on:

A) the maximum lift-coefficient of the wing
B) the excess lift available
C) the excess thrust available
D) the excess power available

The thrust required in a climb is equal to:

A) Drag + (weight x sine climb angle)
B) Drag + (weight x cosine climb angle)
C) Weight + (drag x cosine climb angle)
D) Weight + (drag x sine climb angle)

On a reciprocating engine aeroplane, to maintain a given angle of attack, configuration and altitude at higher gross mass:

A) an increase in airspeed is required but power setting does not change
B) requires an increase in power and decrease in the airspeed
C) a higher coefficient of drag is required
D) an increase in airspeed and power is required

Regarding the best angle and best rate of descent speeds, which of the following statements is true:

A) Weight has no effect on the rate of descent only on the descent slope angle
B) A heavier aircraft must descend at a slower airspeed in order to maintain the same slope as a similar lighter aircraft
C) A heavier aircraft must descend at a faster airspeed in order to maintain the same slope as a similar lighter aircraft
D) Weight has no effect on the descent slope angle or descent rate

In a power-off glide, an increase in aircraft mass will:

A) Not affect the glide angle, but increase the speed for minimum glide angle
B) Not affect the glide angle, and not affect the speed for minimum glide angle
C) Increase the glide angle and increase the speed for minimum glide angle
D) Increase the glide angle, but not affect the speed for minimum glide angle

A single engine aircraft has a climb gradient of 3.3% and a TAS of 100 kts. What is the approximate Rate of Climb?

A) 550 fpm
B) 330 fpm
C) 440 fpm
D) 660 fpm

Higher gross mass at the same altitude decreases the gradient and the rate of climb whereas:

A) VY and VX are decreased
B) VX is increased and VY is decreased
C) VY and VX are not affected by a higher gross mass
D) VY and VX are increased

41. If an aircraft flies at its best angle of climb it will:

A) Achieve its cruise altitude in the shortest distance
B) Be flying faster than when if it were flying at the best rate of climb speed
C) Achieve its cruise altitude in the shortest time
D) Also be flying at its best rate of climb

The recommended range speed may exceed the theoretical speed for maximum range because of:

A) reduced speed stability at low speed
B) compressibility effects
C) reduced engine life
D) reduced directional control at low speed

As speed increases the thrust of a fixed pitch propeller will :

A) Increase to a constant value
B) Decrease initially and then increase
C) Decrease to a constant value
D) Eventually decrease to zero

The maximum range for a piston /propeller aircraft is obtained at:

A) VIMD at the lowest practical altitude at low RPM
B) VIMP at the most efficient altitude for the power units
C) VIMP at the lowest practical altitude at low RPM
D) VIMD at the most efficient altitude for the power units

When assessing the enroute performance, it may not be assumed that the aircraft is flying at an altitude exceeding (single engine class B):

A) The altitude at which the rate of climb is 300ft/min with maximum take-off power
B) The absolute ceiling with maximum continuous power
C) The altitude at which the rate of climb is 300ft/min with maximum continuous power
D) The altitude at which a gradient of 0.5 percent is achieved with maximum continuous power

Given:

ROC = 860 ft / min
TAS = 92 kts
Wind = 16 kts Tail wind

What is the approximate gradient of climb?

A) 8%
B) 5%
C) 6%
D) 7%

At sea level ISA an aircraft has a rate of climb of 650ft/min at an indicated airspeed of 85kts. The climb gradient in still air is:

A) 1.3 percent
B) 13 percent
C) 0.75 percent
D) 7.5 percent

The pilot of a single engine aircraft has established the climb performance. The carriage of an additional passenger will cause the climb performance to be:

A) Degraded
B) Unchanged
C) Unchanged, if a short field take-off is adopted
D) Improved

The effect of increased mass on the climb gradient is:

A) increase due to increased speed required at optimum angle of attack
B) increase due to increased lift required
C) decrease due to increased drag and reduced ratio of excess thrust to weight
D) decrease due to increased drag

Which airspeed provides the greatest gain in altitude in a given period of time?

A) Va
B) Vy
C) Vcl
D) Vx

Which combination of forces on the aircraft determine the climb gradient:

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

How does an increase in aircraft mass affect the gliding range?

A) none of the above
B) increases range
C) decreases range
D) has no effect on range

For a piston engine aircraft the service ceiling corresponds to:

A) The altitude for which the power required and power available curves are tangential
B) The altitude at which the aircraft is capable of a climb rate of 100 feet per minute
C) The greatest altitude at which more than one speed is available
D) The altitude at which the aircraft is capable of a climb rate of 500 feet per minute

For a given mass, as altitude increases, the minimum total drag will:

A) remain the same and the minimum drag speed (TAS) will remain the same
B) decrease, and the minimum drag speed (TAS) will decrease
C) increase, and the minimum drag speed (TAS)will increase
D) remain the same and the minimum drag speed (TAS) will increase

The maximum rate of descent will occur:

A) at Vmo with the aircraft in clean configuration
B) at a speed close to the stalling speed with all permissible drag producing devices deployed
C) at Vmo with all permissible drag producing devices deployed
D) at a speed corresponding to the maximum lift-to-drag ratio with the aircraft in the clean configuration

The climbing speed that will attain the maximum gradient of climb:

A) Vimd
B) Vx
C) Vy
D) Vimp

For an aircraft in steady straight flight, if the tail load is acting downwards for balance:

A) The wing lift will be greater than the weight and the induced drag will be greater than with zero tail-load
B) The wing lift will be greater than the weight and the induced drag will be the same as with zero tail-load
C) The wing lift will be less than the weight and the induced drag will be less than with zero tail-load
D) The wing lift will equal the weight and the induced drag will be the same as with zero tail-load

If the aircraft mass increases, how does the (i) rate of climb, and (ii) rate of climb speed change?

A) increase; increase
B) decrease; increase
C) decrease; decrease
D) increase; decrease

Given:
Still air gradient of climb: 5%
TAS: 250 kts
G/S: 200 kts
The rate of climb is:

A) 1000 fpm
B) 500 fpm
C) 1250 fpm
D) 2000 fpm

What affect has a tailwind on the maximum endurance speed?

A) The IAS will be decreased
B) The IAS will be increased
C) Tailwind only effects holding speed
D) No affect

---

61. In a power-off glide in still air, to obtain the maximum glide range, the aircraft should be flown:

A) at a speed corresponding to the minimum drag coefficient
B) at a speed corresponding to the maximum lift-to-drag ratio
C) at a speed close to the stall
D) at a speed close to Vne

The maximum excess power yields the maximum... that can be generated by the airplane at a given altitude.

A) angle of descent
B) rate of climb
C) angle of climb
D) rate of descent

The force that exactly opposes and balances lift in a straight and un-accelerated climb is:

A) weight x sin(climb angle)
B) weight x cos(climb angle)
C) thrust x sin(climb angle)
D) thrust x cos(climb angle)

What will the effect be of changes of ambient temperature on the performance of an aeroplane if all other performance parameters remain constant?

A) An increase in ambient temperature will cause a reduction in the required landing distance
B) An increase in ambient temperature will cause a reduction in the required takeoff distance
C) A reduction in ambient temperature will cause an increase in the takeoff run
D) A decrease in ambient temperature will cause an increase in the climb gradient

A lower airspeed at constant mass and altitude requires

A) more thrust and a lower coefficient of lift
B) a higher coefficient of lift
C) less thrust and a lower coefficient of lift
D) more thrust and a lower coefficient of drag

Which of the following statements is correct? If the aircraft mass, in a horizontal un-accelerated flight, decreases

A) the minimum drag decreases and the IAS for minimum drag increases
B) the minimum drag increases and the IAS for minimum drag decreases
C) the minimum drag decreases and the IAS for minimum drag decreases
D) the minimum drag increases and the IAS for minimum drag increases

With a headwind, compared to still air conditions, the rate of climb (i) and the climb angle relative to the ground (ii) will :

A) (i) remain the same (ii) increase
B) (i) remain the same
C) (i) increase (ii) increase
D) (i) increase (ii) remain the same

(For this Question use CAP 698 Figure 2.3)
Using the climb performance chart, for the single engine aeroplane, determine the ground distance to reach a height of 1500 ft above the reference zero in the following conditions:
Given:
O.A.T at Take-off: ISA
Airport pressure altitude: 5000 ft
Aeroplane mass: 3300 lbs
Speed: 100 KIAS
Wind component: 5 kts Tailwind

A) 18 073 ft
B) 18 909 ft
C) 16 665 ft
D) 20 109 ft

(For this Question use CAP 698 Figure 2.3)
With regard to the climb performance chart for the single engine aeroplane determine the climb speed (ft/min).
Given:
O.A.T: ISA + 15° C
Pressure Altitude: 0 ft
Aeroplane Mass: 3400 lbs
Flaps: up
Speed: 100 KIAS

A) 1150 ft/min
B) 1210 ft/min
C) 1290 ft/min
D) 1370 ft/min

The maximum level flight speed will be obtained:

A) When the power required equals the power available from the engine
B) When the power required equals the minimum available power
C) When the maximum power required equals the minimum available power
D) When the power required equals the maximum available power

In a banked turn:

A) the stalling angle reduces
B) the stalling angle increases
C) the stall speed decreases
D) the stall speed increases

The effect of a tailwind on the glide angle and the rate of descent assuming same CAS will be:

A) increases and increases
B) decreases and remains the same
C) remains the same and increases
D) decreases and decreases

Which condition would cause the altimeter to indicate a lower altitude than actually flown (true altitude)?

A) An altimeter always indicates the true altitude
B) Air temperature lower than standard
C) Air temperature warmer than standard
D) Atmospheric pressure lower than standard

An aircraft glides for a distance of 25 NM in still air at a speed of 75 knots IAS which is a True air speed of 85 knots in the prevailing conditions. In a headwind of 15 knots it would glide for (Class B single engine):

A) 23 NM
B) 20 NM
C) 31 NM
D) 20.6 NM

In straight and level flight the lift is opposed by the:

A) weight
B) drag
C) drag and weight
D) thrust

A headwind component increasing with altitude, as compared to zero wind condition, (assuming IAS is constant):

A) has no effect on rate of climb
B) decreases angle and rate of climb
C) does not have any effect on the angle of flight path during climb
D) improves angle and rate of climb

When does THRUST = DRAG?

A) Climbing at a constant IAS
B) Flying level at a constant IAS
C) Decreasing at a constant IAS
D) All of the above

On a reciprocating engine aeroplane, with increasing altitude at constant gross mass, angle of attack and configuration the power required:

A) increases but TAS remains constant
B) remains unchanged but the TAS increases
C) increases and the TAS increases by the same percentage
D) decreases slightly because of the lower air density

(For this Question use CAP 698 Figure 2.3)
Using the climb performance chart, for the single engine aeroplane, determine the rate of climb and the gradient of climb in the following conditions:
Given:
O.A.T at Take-off: ISA
Airport pressure altitude: 3000 ft
Aeroplane mass: 3450 lbs
Speed: 100 KIAS

A) 1170 ft/min and 9,9%
B) 1310 ft/min and 11,3%
C) 1030 ft/min and 8,4%
D) 1120 ft/min and 9,3%

An aircraft has a climb gradient of 7 percent after take-off. There is an obstacle having a height of 320ft at a distance of 5400ft from the screen. The aircraft will clear the obstacle by:

A) 108 ft
B) 378 ft
C) 58 ft
D) 93 ft

---

81. With increasing altitude, the rate of climb:

A) decreases because power available is constant and power required increases
B) increases because density and drag decrease
C) decreases because power available decreases and power required increases
D) decreases because power available decreases and power required is constant

The induced drag of an aeroplane at constant gross weight and altitude is highest at

A) VS1 (stalling speed in clean configuration)
B) VSO (stalling speed in landing configuration)
C) VMO (maximum operating limit speed)
D) VA (design manoeuvring speed)

A higher outside air temperature

A) increases the angle of climb but decreases the rate of climb
B) reduces the angle of climb but increases the rate of climb
C) reduces the angle and the rate of climb
D) does not have any noticeable effect on climb performance

The maximum indicated air speed of a piston engine aeroplane, in level flight, is reached:
A) at the practical ceiling
B) at the service ceiling
C) at the lowest possible altitude
D) at the optimum cruise altitude

What is the minimum semi-width of the en-route obstacle domain permitted by the JAA?
A) 5 NM
B) 10 NM
C) 20 NM
D) 15 NM

An aircraft has a descent gradient of 4.8% with the engine inoperative. For the purpose of compliance with the en-route requirements, the distance travelled during a height loss of 2000 ft would be (Class B single engine):
A) 6.8 NM
B) 7.65 NM
C) 6.2 NM
D) 9.6 NM

As long as an aeroplane is in a positive climb:
A) VX is always above VY
B) VY is always above VMO
C) VX is sometimes below and sometimes above VY depending on altitude
D) VX is always below VY

For a given aircraft mass, the climb gradient:
A) increases with increasing flap angle and decreasing temperature
B) decreases with increasing flap angle and decreasing temperature
C) decreases with increasing flap angle and increasing temperature
D) increases with increasing flap angle and increasing temperature

For a given aircraft mass the climb gradient is determined by:
A) thrust - drag
B) lift - drag
C) lift - weight
D) thrust - weight

The climb gradient will be reduced by:
A) low pressure altitude, high mass and high temperature
B) high pressure altitude, turning flight and low temperature
C) high mass, low temperature and high flap angle
D) high temperature, high pressure altitude and contaminated airframe

An aircraft is operating at the optimum glide speed. When mass decreases what happens to the glide angle and rate of descent?
A) Both the glide angle and rate of descent are unchanged
B) The glide angle decreases and the rate of descent is unchanged
C) The glide angle decreases and the rate of descent decreases
D) The glide angle is unchanged and the rate of descent decreases

Performance Class B - Single Engine
Definitions of terms and speeds:

Which statement is correct?

A) In case of engine failure below VR the take-off should be aborted
B) VR is the lowest speed for directional control in case of engine failure
C) VR is the lowest climb speed after engine failure
D) VR is the speed at which rotation should be initiated

Which would provide the greatest gain in altitude in the shortest distance during climb after takeoff?

A) Vcl
B) Vx
C) Va
D) Vy

When a stopway and/or a clearway is available the take-off distance must:

A) not exceed TORA and when multiplied by 1.3 not exceed ASDA and when multiplied by 1.15 not exceed TODA
B) not exceed TORA
C) when multiplied by 1.15, not exceed TODA
D) when multiplied by 1.3, not exceed ASDA

For a piston engine aeroplane, the speed for maximum range is:

A) that which gives the maximum value of lift
B) 1.4 times the stall speed in clean configuration
C) that which gives the maximum lift to drag ratio
D) that which gives the minimum value of drag

V2 has to be equal to or higher than:

A) 1.15 VR
B) VMCA
C) VSO
D) 1.15 VMCG

A frangible obstacle is classed as:

A) An obstruction that must be removed from any part of the manoeuvring
B) An obstruction in the take off path that is a minimum hazard to an aircraft
C) An obstruction in the take off path that limits the length of the stopway
D) An obstruction that must be taken into account for performance calculations

V1 has to be:
A) higher than VR
B) equal to or higher than VMCG
C) equal to or higher than V2
D) equal to or higher than VMCA

For a multi engine aircraft not certified under JAR 25- Performance Class B, the absolute ceiling is defined as:
A) the altitude at which the rate of climb of an aircraft is 100 ft per minute at maximum power
B) the altitude at which the rate of climb of an aircraft is 500 ft per minute at maximum power
C) the altitude at which the rate of climb of an aircraft is 100 ft per minute at maximum cruise setting
D) the altitude at which the rate of climb of an aircraft is equal to 0 ft per minute at maximum power

Reference zero is a point 35ft vertically beneath the aircraft at the end of:
A) TODR
B) ASDA
C) TODA
D) TORA

The rotation speed (Vr):
A) is always equal to V1 for aeroplanes with 2 engines
B) must not be more than 1.05 Vmca
C) is the airspeed at which the aeroplane lifts off the ground
D) must not be less than 1.05 Vmca

With which conditions would one expect Vmc to be the lowest?
A) Hot temp, low-pressure altitude, high humidity
B) Cold temp, low altitude, low humidity
C) Cold temp, high altitude, low humidity
D) Hot temp, high-pressure altitude, high humidity

The airspeed at which the main wheels of an aircraft leave the ground during take-off is called:
A) V2
B) Vmc
C) VR
D) VLOF

The speed V2 is defined for jet aeroplane as:
A) take-off decision speed
B) take-off climb speed or speed at 35 ft
C) critical engine failure speed
D) lift off speed

Given that:

VEF = Critical engine failure speed
VMCG = Ground minimum control speed
VMCA = Air minimum control speed
VMU = Minimum unstick speed
V1= Take-off decision speed
VR= Rotation speed
V2 min. = Minimum take-off safety speed

The correct formula is:
A) VMCG < = VEF < V1
B) 1.05 VMCA < = VEF < = V1
C) V2 min < = VEF < = VMU
D) 1.05 VMCG < VEF < = VR

Which denotes the stall speed in the landing configuration?
A) VS1
B) VS
C) VS1G
D) VSO

The take-off decision speed V1 is:
A) a chosen limit. If an engine failure is recognized after reaching V1 the take-off must be aborted
B) a chosen limit. If an engine failure is recognized before reaching V1 the take-off must be aborted
C) not less than V2min, the minimum take-off safety speed
D) sometimes greater than the rotation speed VR

Stalling speed in landing configuration is defined as the stalling speed
A) with flaps in landing configuration and gear up
B) with flaps up and gear up
C) with flaps in landing configuration and gear down
D) with flaps up and gear down

The critical engine inoperative:
A) does not affect the aeroplane performance since it is independent of the power plant
B) increases the power required and decreases the total drag due to the windmilling engine
C) decreases the power required because of the lower drag caused by the windmilling engine
D) increases the power required because of the greater drag caused by the windmilling engine and the compensation for the yaw effect

ASDA is defined as:
A) TORA plus clearway
B) TORA plus stopway
C) TODA plus stopway
D) the same as TODA

The stopway is an area which allows an increase only in :
A) the landing distance available
B) the take-off run available
C) the accelerate-stop distance available
D) the take-off distance available

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21. The speed at the 50 ft screen (VRef) should be (Class B multi engine):
A) not less than the greater of 1.1 VMC or 1.2 VSO
B) not greater than VMC or 1.3 VSO
C) not less than the lower of VMC or 1.3 VSO
D) not less than the greater of VMC or 1.3 VSO

Which statement regarding V1 is correct?
A) V1 is not allowed to be greater than VR
B) V1 is not allowed to be greater than VMCG
C) The V1 correction for up-slope is negative
D) When determining the V1, reverse thrust is only allowed to be taken into account on the remaining symmetric engines

A clearway:
A) Need not have the same weight bearing qualities as the runway with which it is associated
B) All of the above
C) May be water
D) Provides an area over which an aeroplane can safely transit from lift off to the required height

For a contaminant to be considered significant its depth must exceed:
A) 10 mm of Dry Snow
B) 5 mm of Wet Snow
C) 3 mm of Water
D) 2mm of Water

What is the advantage of a balanced field length condition?

A) A balanced take-off provides the lowest elevator input force requirement for rotation
B) For a balanced field length the required take-off runway length always equals the available runway length
C) A balanced field length provides the greatest margin between " net" and " gross" take-off flight paths
D) A balanced field length gives the minimum required field length in the event of an engine failure

Vref is:

A) 1.43 x Vs
B) 1.3 x Vs
C) 1.15 x Vs
D) 1.2 x Vs

Clearway length is limited by:

A) A load bearing strength less than that of the runway
B) The first obstacle likely to damage the aircraft in the event of an abandoned take-off after engine failure
C) A ditch located at the end of ASDA
D) The first obstacle likely to damage the aeroplane in the event of a continued take-off after engine failure

The speed V1 is:

A) the critical speed for engine failure during take off
B) the stalling speed with the flaps in a prescribed position
C) the speed at which, with the critical engine inoperative, the TODR will not exceed the TODA, the TORR will not exceed the TORA and the ASDR will not exceed the ASDA
D) the speed at which rotation to the unstick attitude is initiated

Rotation speed Vr, for class B multi engine aeroplanes, must not be less than:

A) 1.2 Vs1
B) 1.05 Vmca
C) Vmcg
D) Vmca

Which take-off speed is affected by the presence or absence of stopway and/or clearway?

A) VMCA
B) VMCG
C) V1
D) V2

Given:
RW 17 touchdown elevation = 146 feet
TORA = 1400 m
ASDA = 1600 m
TODA = 1800 m

RW 35 touchdown elevation 34 feet
TORA = 1500 m
ASDA = 1700 m
TODA = 1900 m

The slope of RW 35 is:
A) 2.28% down
B) 2.44% down
C) 2.44% up
D) 2.28% up

The speed V1 is defined as:
A) speed for best angle of climb
B) take-off climb speed
C) engine failure speed
D) take-off decision speed

The estimated braking action for a runway having a friction coefficient of 0.35 would be:
A) Good
B) Poor
C) Medium
D) Unreliable

The Clearway at an aerodrome is an area beginning :
A) at the end of the runway, clear of obstacles and capable of supporting the weight of the aircraft during an emergency stop
B) at the end of the runway, with a minimum width of 60 m each side of the centre line and clear of obstacles
C) at the end of the stopway, with a width equal to the runway width, and clear of obstacles
D) at the end of the runway, having a minimum required width, disposed equally about the extended centre line, with no obstacles protruding above a plane sloping upwards with a slope of 1.25%

The Service Ceiling is the pressure altitude where :
A) the rate of climb reaches a specified value
B) the lift becomes less than the weight
C) the rate of climb is zero
D) the low speed and high speed buffet are coincident

Minimum control speed on ground, VMCG, is based on directional control being maintained by:
A) primary aerodynamic control and nosewheel
B) primary aerodynamic control only
C) nosewheel steering only
D) primary aerodynamic control, nosewheel steering and differential braking

The landing reference speed VREF has, in accordance with international requirements, the following margins above stall speed in landing configuration:
A) 20%
B) 15%
C) 30%
D) 10%

The maximum operating altitude for a certain aeroplane with a pressurised cabin:
A) is dependent on aerodynamic ceiling
B) is only certified for four-engine aeroplanes
C) is the highest pressure altitude certified for normal operation
D) is dependent on the OAT

The minimum value of V2 must exceed " air minimum control speed" by:
A) 20%
B) 10%
C) 30%
D) 15%

Vy is defined as:
A) speed for best angle of climb
B) speed for soft field landing
C) speed for best rate of climb single engine
D) speed for best rate of climb

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41. A BALANCED FIELD LENGTH is said to exist where:
A) The clearway does not equal the stopway
B) The one engine out take-off distance is equal to the all engine take-off distance
C) The accelerate stop distance is equal to the all engine take-off distance
D) The accelerate stop distance is equal to the take-off distance available

The speed V2 is:
A) that speed at which the PIC should decide to continue or not the take-off in the case of an engine failure
B) the take-off safety speed
C) the lowest airspeed required to retract flaps without stall problems
D) the lowest safety airspeed at which the aeroplane is under control with aerodynamic surfaces in the case of an engine failure

The take-off distance available is:

A) the runway length plus half of the clearway
B) the total runway length, without clearway even if this one exists
C) the length of the take-off run available plus the length of the clearway available
D) the runway length minus stopway

Field length is balanced when

A) take-off distance equals accelerate-stop distance
B) all engine acceleration to V1 and braking distance for rejected take-off are equal
C) one engine acceleration from V1 to VLOF plus flare distance between VLOF and 35 feet are equal
D) calculated V2 is less than 110% VMCA and V1, VR, VMCG

A multi engine aeroplane is flying at the minimum control speed (VMCA). Which parameter(s) must be maintainable after engine failure?

A) Heading, altitude and a positive rate of climb of 100 ft/min
B) Straight flight
C) Straight flight and altitude
D) Altitude

The load factor is the ratio of:

A) Thrust : Weight
B) Total lift : Weight
C) Lift : Drag at the optimum angle of attack
D) Weight : Maximum Authorised Weight

A stopway is:

A) An extension to the take-off runway free of obstacles which can be used to extend the take-off run
B) An extension to the take-off runway capable of supporting the aeroplane during an aborted take-off
C) An extension to the take-off runway free of obstacles but not capable of supporting the aeroplane in the event of an aborted take-off
D) An extension to the Take-off runway free of obstacles

For a twin-engine class B aircraft the rotation speed Vr must not be less than:

A) 1,05Vmc or 1,1Vs1
B) the stalling speed with the flaps in the take-off position (Vs1)
C) 1,1Vmc or 1,2Vs1
D) 1,05Vmc or 1,2Vs1

The speed VLO is defined as

A) landing gear operating speed
B) long distance operating speed
C) lift off speed
D) design low operating speed

A runway end safety area should extend from the end of the runway strip for as far as practicable, but at least:

A) 60 m.
B) 90 m.
C) 120 m.
D) 300 m.

JAR-OPS state that propeller driven aircraft with a maximum approved passenger seating configuration of _____ or less and a maximum take-off mass of _____ or less must comply with the requirements of Performance Class B.

A) 9; 5700 Kg
B) 9; 12500 Kg
C) 18; 5700 Kg
D) 18; 12500 Kg

The absolute ceiling:

A) is the altitude at which the aeroplane reaches a maximum rate of climb of 100 ft/min.
B) can be reached only with minimum steady flight speed.
C) is the altitude at which the best climb gradient attainable is 5%.
D) is the altitude at which the maximum rate of climb is zero.

Given:
VS = Stalling speed
VMCA = Air minimum control speed
VMU = Minimum unstick speed (disregarding engine failure)
V1 = Take-off decision speed
VR = Rotation speed
V2 min. = Minimum take-off safety speed
VLOF = Lift-off speed
The correct formula is:

A) V2 min < VMCA > VMU
B) VMU < = VMCA < V1
C) VR < VMCA < VLOF
D) VS < VMCA < V2 min

VX is defined as:

A) the speed for best specific range
B) the speed for best angle of flight path
C) the speed for best rate of climb
D) the speed for best angle of climb

The specific range (SR) is :

A) the distance that the aircraft would fly per kilogram of fuel
B) the distance that the aircraft would fly without using the reserve fuel
C) the distance that the aircraft would fly with full fuel
D) the distance that the aircraft could fly with the capacity payload

Which of the following statements is correct?

A) VR is the speed at which the pilot should start to rotate the aeroplane
B) VR is the speed at which, during rotation, the nose wheel comes off the runway
C) VR should not be higher than V1
D) VR should not be higher than 1.05 VMCG

The drift down is a procedure applied:

A) after aircraft depressurisation
B) when the engine fails above the operating altitude for one engine inoperative
C) for a visual approach to a VASI
D) for an instrument approach at an airfield without an ILS

The Mach number is the ratio of:

A) True Air speed : Speed of sound in ISA conditions
B) True Air speed : Speed of sound at sea level
C) Indicated Air speed : local speed of sound
D) True Air speed : Local speed of sound

Stalling speed in landing configuration are certified with:

A) flaps in landing configuration and gear down
B) flaps in clean configuration and gear down
C) flaps in clean configuration and gear up
D) flaps in take of position and gear down

Commuter aircraft are propeller driven twin engine aircraft that have a seating configuration of... or fewer and a max. Certificated T.O.W. of... or less.

A) 15, 5618 lb
B) 23, 22500 lb
C) 19, 19000 lb
D) 45, 17500 lb

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61. In climb limited mass calculations, the climb gradient is a ratio of:

A) height gained over distance travelled through the air
B) TGS over rate of climb
C) height gained over distance travelled across the ground
D) TAS over rate of climb

The speed for best rate of climb is called

A) V2
B) Vcl
C) Vx
D) Vy

What is pressure altitude?

A) The same as density altitude
B) The indicated altitude corrected for non-standard temperature and pressure
C) The indicated altitude corrected for position and installation errors
D) The altitude indicated on the altimeter when the barometric pressure scale is set to 29.92 inches of mercury

Which of the following three speeds of a jet aeroplane are basically identical?
The speeds for:

A) maximum climb angle, minimum glide angle and maximum range
B) holding, maximum climb angle and minimum glide angle
C) maximum drag, maximum endurance and maximum climb angle
D) maximum range, minimum drag and minimum glide angle

In a multi engine aeroplane the critical engine is

A) The engine which causes the largest yawing moment upon engine failure
B) The engine which causes the greatest rolling moment upon engine failure
C) The engine which causes the largest reduction in climb performance upon engine failure
D) The engine which causes the longest landing distance upon engine failure

Which of the following will decrease V1?

A) Increased outside air temperature
B) Inoperative anti-skid
C) Increased take-off mass
D) Inoperative flight management system

The Gross performance of an aircraft is :

A) the minimum performance achieved by a number of aircraft of the type
B) the average performance achieved by a number of aircraft of the type
C) the minimum performance achieved by the individual aircraft reduced by a specified margin
D) the average performance achieved by a number of aircraft of the type reduced by a specified margin

Importance of performance calculation:

What landing distance requirements must be met at an alternate airfield compared to a destination airfield for a turboprop?

A) Same as destination
B) More than destination
C) None applicable
D) Less than destination

(CAP 698 figure 3.3)
Find the maximum permissible weight for take-off from an aerodrome with a runway length of 1200ft, stopway of 200ft and clearway of 300ft. Given:
Pressure altitude: 4000ft
Temperature: 15° C
Wind component: 10 kts head

A) 3400 lb
B) 4000 lb
C) 4750 lb
D) 4300 lb

Which conditions are most suited to a selection of low flap for take off?

A) High airfield elevations, distant obstacles, long runway, high ambient temperature
B) Low airfield elevation, no obstacles, short runway, low temperature
C) Low airfield elevation, close obstacles, long runway, high temperature
D) High elevation, no obstacles short runway, low temperature

A higher pressure altitude at ISA temperature

A) decreases the field length limited take-off mass
B) increases the climb limited take-off mass
C) decreases the take-off distance
D) has no influence on the allowed take-off mass

For an aircraft having a wing span of 20m, an obstacle at a distance of 1800m from the end of the TODA, would not have to be considered if its distance from the track exceeds (multi engine class B):

A) 285 m
B) 225 m
C) 295 m
D) 233 m

If other factors are unchanged, the fuel mileage (nautical miles per kg) is:

A) lower with a forward centre of gravity position
B) higher with a forward centre of gravity position
C) independent from the centre of gravity position
D) lower with an aft centre of gravity position

What effect has a downhill slope on the take-off speeds? The slope
A) decreases the take-off speed V1
B) increases the IAS for take-off
C) has no effect on the take-off speed V1
D) decreases the TAS for take-off

Changing the take-off flap setting from flap 15° to flap 5° will normally result in:
A) a longer take-off distance and a better climb
B) a better climb and an equal take-off distance
C) a shorter take-off distance and a better climb
D) a shorter take-off distance and an equal climb

SFC will:
A) not be affected by C of G position
B) only be affected by C of G position, if it is behind the C of P
C) increase if C of G is moved further forward of the C of P
D) decrease if C of G is moved further forward of the C of P

The factorization of the reported along track wind component required by JAR-OPS1 when making performance calculations is:
A) 50 percent of the headwind and 100 percent tailwind
B) 100 percent of the headwind and 150 percent of the tailwind
C) 50 percent of the headwind and 150 percent of the tailwind
D) 150 percent of the headwind and 50 percent of the tailwind

The lift-off speed and take-off safety speed (V2) when flap position is changed from 10° to 5° will:
A) decrease and increase
B) increase and decrease
C) increase and increase
D) decrease and decrease

Which of the following speeds can be limited by the 'maximum tyre speed'?
A) Lift-off IAS
B) Lift-off groundspeed
C) Lift-off EAS
D) Lift-off TAS

In a glide (power off descent) if pitch angle is increased, glide distance will:
A) increase
B) decrease
C) remain constant
D) depend on the aircraft

An aeroplane executes a steady glide at the speed for minimum glide angle. If the forward speed is kept constant, what is the effect of a lower mass? Rate of descent... / Glide angle... / CL/CD ratio...

A) decreases / constant / decreases
B) increases / constant / increases
C) increases / increases / decreases
D) increases / increases / constant

A runway is contaminated by a 0,5 cm layer of wet snow. The take-off is nevertheless authorized by a light- twin's flight manual. The take-off distance in relation to a dry runway will be:

A) decreased
B) unchanged
C) very significantly decreased
D) increased

On a dry runway the accelerate stop distance is increased

A) by uphill slope
B) by a lower take-off mass because the aeroplane accelerates faster to V1
C) by low outside air temperature
D) by headwind

The result of a higher flap setting up to the optimum at take-off is:

A) a shorter ground roll
B) a longer take-off run
C) a higher V1
D) an increased acceleration

When the outside air temperature increases, then

A) the field length limited take-off mass and the climb limited take-off mass increases
B) the field length limited take-off mass increases but the climb limited take-off mass decreases
C) the field length limited take-off mass and the climb limited take-off mass decreases
D) the field length limited take-off mass decreases but the climb limited take-off mass increases

Due to standing water on the runway the field length limited take-off mass will be

A) lower
B) higher
C) only higher for three and four engine aeroplanes
D) unaffected

What is the effect of increased mass on the performance of a gliding aeroplane?

A) The speed for best angle of descent increases
B) The lift/drag ratio decreases
C) The gliding angle decreases
D) There is no effect

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21. A runway is contaminated with 0.5 cm of wet snow. The flight manual of a light twin nevertheless authorises a landing in these conditions. The landing distance will be, in relation to that for a dry runway:

A) reduced
B) increased
C) unchanged
D) substantially decreased

Elements of performance:

To determine the flight path after take-off (multi engine class B), if the cloud base at the aerodrome is 1000 ft, it must be assumed that:

A) an engine fails at 1000 ft
B) an engine fails at 1500 ft
C) an engine fails at 950 ft
D) an engine fails at 50 ft

The most efficient angle of attack is:

A) 15°
B) 8°
C) 12°
D) 4°

Which of the following combinations basically has an effect on the angle of descent in a glide? (Ignore compressibility effects.)

A) Mass and altitude
B) Configuration and angle of attack
C) Configuration and mass
D) Altitude and configuration

The take-off distance of an aircraft is 800m in standard atmosphere, no wind at 0 ft pressure-altitude. Using the following corrections:
± 20 m / 1 000 ft field elevation
5 m / kt headwind
+ 10 m / kt tail wind
± 15 m / % runway slope
± 5 m / ° C deviation from standard temperature

The take-off distance from an airport at 2 000 ft elevation, temperature 21° C, QNH 1013.25 hPa, 2% up-slope, 5 kt tail wind is:

A) 870 m
B) 890 m
C) 810 m
D) 970 m

For a multi-engine aircraft in Performance Class B the minimum gross gradient of climb after a balked landing is:

A) 2.5%
B) 3.2%
C) 1.5%
D) 2%

If level flight is maintained but the air density decreases then this would cause:

A) Lift to decrease
B) The lift/drag ratio to increase
C) Available power to improve
D) Little overall change to drag

If the airworthiness documents do not specify a correction for landing on a wet runway; the landing distance must be increased by:

A) 20 %
B) 10 %
C) 15 %
D) 5 %

The coefficient of lift may be increased by lowering the flaps or by:

A) increase of angle of attack
B) reducing nose up elevator trim
C) increase of CAS
D) increase of TAS

The angle of climb with flaps extended, compared to that with flaps retracted, will normally be:

A) Smaller
B) Larger
C) Not change
D) Increase at moderate flap setting, decrease at large flap setting

The speed for maximum lift/drag ratio will result in:

A) The maximum range for a propeller driven aeroplane
B) The maximum angle of climb for a propeller driven aeroplane
C) The maximum endurance for a propeller driven aeroplane
D) The maximum range for a jet aeroplane

Runway 05 is in use and the forecasted wind is 100/45. Calculate the headwind and crosswind components during take-off.

A) HW -7 kts; CW 38 kts
B) HW 28 kts; CW 34 kts
C) HW 34 kts; CW 29 kts
D) Additional information is required

Large flap settings:

A) Affect neither drag nor stalling speed
B) Reduced stalling speed considerably and increase drag
C) Increase both drag and stalling speed
D) Reduce stalling speed slightly but increase drag considerably

Induced drag is caused by:

A) Boundary layer surface friction
B) Aerofoil shape
C) Inadequate streamlining
D) The angle of attack

When approaching a wet runway, with the risk of hydroplaning, what technique should the pilot adapt?

A) Normal landing, full reverse and brakes at VP
B) Smoothest possible touch down, full reverse and only brakes below VP
C) Positive touch down full reverse and only brakes below VP
D) Positive touch down, full reverse and brakes as soon as possible

The effect of change of ambient temperature on an aeroplane performance will be to:

A) Cause an increase of the climb gradient for a decrease in temperature
B) Cause an increase in the take-off gound run for a decrease in temperature
C) Cause a decrease in the landing distance required for an increase in temperature
D) Cause a decrease in take-off distance required for an increase in temperature

Why is there a requirement for an approach climb gradient?

A) To maintain minimum altitude on the approach
B) Adequate performance for a go-around in the event of an engine failure
C) So that the aircraft will not stall when full flap is selected
D) So that an aircraft falling below the glide path will be able to re-intercept it

Which statement regarding the relationship between traffic load and range is correct?

A) The traffic load can be limited by the desired range
B) The maximum traffic load is not limited by the reserve fuel quantity
C) The maximum landing mass is basically equal to the maximum zero fuel mass
D) The maximum zero fuel mass limits the maximum quantity of fuel

Climbing to cruise altitude with a headwind will:

A) decreased time to climb
B) increase time to climb
C) increased ground distance covered to climb
D) decrease ground distance covered to climb

The absolute ceiling of an aircraft is the altitude at which:

A) The IAS and MACH no. produce the same TAS
B) Power required in level flight equals the power available
C) The high speed buffet is encountered
D) Thrust available in level flight equals the thrust required

Which of the following statements is correct?

A) Induced drag decreases with increasing speed
B) Induced drag is independent of the speed
C) Induced drag decreases with increasing angle of attack
D) Induced drag increases with increasing speed

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21. During climb with all engines, the altitude where the rate of climb reduces to 100 ft/min is called:

A) Absolute ceiling
B) Service ceiling
C) Thrust ceiling
D) Maximum transfer ceiling

Landing on a runway with 5mm wet snow will:

A) give a slightly reduced landing distance, due to increased impingement drag
B) not affect the landing distance
C) increase landing distance
D) decrease landing distance

With a true airspeed of 194 kt and a vertical speed of 1 000 ft/min, the climb gradient is about:

A) 8%
B) 5°
C) 3%
D) 3°

How is VMCA influenced by increasing pressure altitude?

A) VMCA is not affected by pressure altitude
B) VMCA increases with pressure altitude higher than 4000 ft
C) VMCA increases with increasing pressure altitude
D) VMCA decreases with increasing pressure altitude

(CAP 698 figure 3.4)
In the event of an engine failure during the take-off run, find the gross accelerate-stop distance required if the take-off is aborted. Given:

Pressure altitude: 2000ft
Temperature: 18° C
Weight: 4600lb
Reported wind component: 4 kts tailwind

A) 2850 ft
B) 2400 ft
C) 3900 ft
D) 3000 ft

The induced drag of an aeroplane:

A) decreases with increasing gross weight
B) increases with increasing airspeed
C) is independent of the airspeed
D) decreases with increasing airspeed

In the drift down for an aeroplane in Performance Class B the net gradient of descent is assumed to be gross gradient of descent _____ by _____ .

A) increased; 0.77 %
B) decreased; 0.5 %
C) increased; 0.5 %
D) decreased; 0.77 %

If an aircraft is put into a 2G turn from level flight, maintaining speed :

A) CL will double, CD will double
B) CL will increase by square root of 2, CD will increase by four
C) CL will increase by four, CD will double
D) CL will double, CD will increase by four

How does the power required graph move with an increase in altitude?

A) Straight across to the right
B) Straight up
C) Up and to the right
D) Straight down

An aeroplane is in a power off glide at best gliding speed. If the pilot increases pitch attitude the glide distance:

A) remains the same
B) decreases
C) may increase or decrease depending on the aeroplane
D) increases

When flying in a headwind, the speed for max range should be:

A) slightly decreased
B) slightly increased
C) should be increased, or decreased depending on the strength of the wind
D) unchanged

The speed at the 50ft screen (multi engine class B) should be:

A) not greater than Vmc or 1,3Vso
B) not less than the greater of Vmc or 1,3Vso
C) not less than the lower of Vmc or 1,3Vso
D) not less than the greater of 1,1Vmc or 1,2Vso

What is the effect of increased weight on (i) ROC and (ii) best ROC speed?

A) u(i) reduces, (ii) reduces
B) u(i) increases, (ii) increases
C) u(i) increases, (ii) reduces
D) u(i) reduces, (ii) increases

Which of the following combinations adversely affects take-off and initial climb performance?

A) High temperature and low relative humidity
B) Low temperature and low relative humidity
C) Low temperature and high relative humidity
D) High temperature and high relative humidity

The position of the aerodynamic centre of an aerofoil in level flight is positioned at approximately .... of the chord line from the leading edge.

A) 20%
B) 35%
C) 25%
D) 30%

Given:
Airfield elevation = 1 250 m
QNH = 1024 hPa
OAT = 34° C
The density altitude is:

A) 7590 ft
B) 6 946 ft
C) 6724 ft
D) 7268 ft

An aircraft is climbing at VX. If the speed is increased, maintaining the power setting,

A) the climb gradient will increase and the rate of climb decrease
B) the climb gradient will decrease and the rate of climb increase
C) the climb gradient will decrease and the rate of climb decrease
D) the climb gradient will increase and the rate of climb increase

What is the effect of increasing the flap setting on (i) gradient and (ii) rate of climb?

A) (i) increases, (ii) increases
B) (i) decreases, (ii) does not change
C) (i) does not change, (ii) decreases
D) (i) decreases, (ii) decreases

If the aircraft CG is moved into a more forward position :

A) the drag will be increased, lift will be decreased and the range will be decreased
B) the drag and lift will be increased and the range will be decreased
C) the drag and lift will be increased and the range will be increased
D) the drag will be decreased, the lift will be increased and the range will be increased

Which of the following statements is true with regard to the en-route regulations (Class B multi engined):

A) The maximum altitude to be assumed may be determined with maximum take off power
B) In assessing the en-route performance it may not be assumed that the aircraft is initially above an altitude at which a 300 ft/min rate of climb can be achieved with one engine inoperative
C) The aircraft may not cruise at an altitude above that at which a 300 ft./min. rate of r climb can be achieved
D) In assessing the en-route performance it may not be assumed that the aircraft is initially above an altitude at which a rate of climb of 300 ft/min can be achieved with all engines operating

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41. Which of the following statements is true regarding the performance of an aeroplane in level flight?

A) The maximum level flight speed will be obtained when the power required equals the minimum power available from the engine
B) The minimum level flight speed will be obtained when the power required equals the maximum power available from the engine
C) The maximum level flight speed will be obtained when the minimum power required equals the power available from the engine
D) The maximum level flight speed will be obtained when the power required equals the maximum power available from the engine

Which of the following light twins will get more control difficulties if the left engine stops when airborne from the runway 36 and there is reported wind from 270/10 kt?

A) All have same control problems
B) Clockwise rotation propellers
C) Counter rotation propellers
D) Counter clockwise rotation propellers

What is the effect on the stalling speed (IAS) with (i) increased mass, (ii) increased altitude, and (iii) increased flap angle :

A) u(i) increases (ii) remains the same (iii) increases
B) u(i) increases (ii) remains the same (iii) decreases
C) u(i) remains the same (ii) decreases (iii) decreases
D) u(i) increases (ii) increases (iii) increases

The coefficient of lift can be increased by lowering flaps or:

A) by increasing IAS
B) by increasing A of A
C) by reducing the nose-up trim
D) by increasing TAS

Increased ambient temperature allows:

A) decreased maximum brake energy limited mass
B) increased field length limited mass
C) increased climb limited mass
D) decreased take-off distance

In a level turn at constant indicated speed the load factor depends on:

A) angle of bank and TAS
B) altitude
C) radius of turn and aircraft weight
D) angle of bank only

Following a take-off, limited by the 50 ft screen height, a light twin climbs on a gradient of 5%. It will clear a 160 m obstacle in relation to the runway (horizontally), situated at 5 000 m from the 50 ft point with an obstacle clearance margin of:

A) it will not clear the obstacle
B) 105 m
C) 75 m
D) 90 m

Ram effect is caused by:

A) Decreased temperature
B) Decreased altitude
C) Forward speed of the aircraft
D) Increased fuel flow

The optimum altitude

A) is the altitude up to which cabin pressure of 8 000 ft can be maintained
B) decreases as mass decreases
C) increases as mass decreases and is the altitude at which the specific range reaches its maximum
D) is the altitude at which the specific range reaches its minimum

Considering TAS for maximum range and maximum endurance, other factors remaining constant,

A) both will stay constant regardless of altitude
B) both will increase with increasing altitude
C) TAS for maximum range will increase with increased altitude while TAS for maximum endurance will decrease with increased altitude
D) both will decrease with increasing altitude

You are the commander of a light twin piston aircraft. The aircraft performance has been calculated, but before departure another passenger is taken on board. What will be the effect of the extra passenger on board?

A) The performance will be improved
B) The performance will be degraded, the performance calculations should be performed again
C) The performance will be degraded but the performance calculations need not be performed again as the safety factors are so large
D) No effect

Induced drag is caused by:

A) Increased zero-lift drag
B) Boundary layer effects
C) Movement of the aerofoil through the air
D) The shape of the aerofoil

Calculate the still air gradient of climb, given that the aircraft climbs at 1500fpm with a TAS of 300kts and there is a tailwind of 50kts.

A) 4,9 percent
B) 5,9 percent
C) 5,4 percent
D) 4,1 percent

An aircraft has two certified landing flaps positions, 25° and 35° . If a pilot chooses 35° instead of 25° , the aircraft will have:

A) an increased landing distance and better go-around performance
B) a reduced landing distance and better go-around performance
C) an increased landing distance and degraded go-around performance
D) a reduced landing distance and degraded go-around performance

A higher temperature causes _____ in air density and _____ in lift.

A) increase; decrease
B) decrease; increase
C) decrease; decrease
D) increase; increase

The maximum rate of climb speed for a propeller-driven aircraft is equal to:

A) 1.1 x VPmin
B) VDmin (minimum drag speed)
C) VPmin (minimum power speed)
D) 1.2 x VDmin

The speed that will attain the greatest rate of climb is where the greatest excess of:

A) Thrust over drag occurs on the drag curve
B) Thrust available over power required occurs on the power curves
C) Power available over drag occurs on the drag curve
D) Power available over power required occurs on the power curves

For a twin-engine class B aircraft, in the event of a single engine failure enroute:

A) The gross gradient of climb may be used in assessing obstacle clearance
B) It must not be assumed to be flying above an altitude at which the rate of climb equals 500ft/min
C) It must be able to continue the flight to a point 1000ft above an aerodrome at which the performance requirements for landing can be met
D) It must be able to remain at least 1000ft above the minimum altitude for safe flight in continuing to a suitable landing aerodrome

Given:
Pressure altitude = 2 080 ft
True temperature = +15º C
What is the density altitude?

A) 1170 ft
B) 2560 ft
C) 3040 ft
D) 2080 ft

At a given mass, the stalling speed of a twin engine aircraft is 100 kt in the landing configuration. The minimum speed a pilot must maintain in short final is:

A) 125 kt
B) 115 kt
C) 130 kt
D) 120 kt

---

61. If mass increases, the power required curve of an aeroplane:

A) moves down and to the left
B) moves up and to the left
C) moves horizontally right
D) moves up and to the right

(CAP 698 Figure 3.9)
Find the gross landing distance required, taking into account the temperature and factored wind, for the following conditions:

Pressure altitude: 2000 ft
Temperature: 4° C
Weight: 4100 lb
Reported wind: 5 kt head
Runway slope: level

A) 1220 ft
B) 2400 ft
C) 2280 ft
D) 3600 ft

What is the effect of extending flaps on VX and VY?

A) VX decreases and VY decreases
B) VX increases and VY increases
C) VX decreases and VY increases
D) VX increases and VY decreases

Which of the following provides maximum obstacle clearance during climb?

A) The speed, at which the flaps may be selected one position further UP
B) The speed for maximum climb angle Vx
C) The speed for maximum rate of climb
D) 1.2Vs

What happens to V_X and V_Y as altitude increases?

A) VX incrases and VY decreases
B) VY remains constant and VX decreases
C) VY remains constant and VX increases
D) both remain constant

With a low angle of attack drag is mostly:

A) Momentum
B) Profile
C) Vortex
D) Induced

The effect an increase of altitude has on lift, if level flight is to be maintained, requires:

A) The angle of attack increased and / or the speed to be increased
B) The angle of attack decreased and / or the speed to be increased
C) The angle of attack increased and / or the speed to be decreased
D) The angle of attack decreased and / or the speed to be decreased

What will be the influence of the aeroplane performance if aerodrome pressure altitude is increased?

A) It will decrease the take-off distance
B) It will increase the accelerate stop distance available
C) It will increase the take-off distance
D) It will increase the take-off distance available

(CAP 698 figure 3.9)
Find the maximum planned landing weight to comply with the regulations, for the following conditions:
Pressure altitude: sea level
Temperature: 30° C
Forecast wind component: 10kt head
Runway length: 3000ft (hard, dry and level)

A) 4250 lb
B) 3500 lb
C) 4000 lb
D) 3650 lb

The temperature at an airfield at 3 000 ft AMSL is 84° F. This represents:

A) ISA +21° C
B) ISA +20° C
C) ISA +15° C
D) ISA +17° C

Maximum endurance for a piston engine aeroplane is achieved at:

A) The speed that approximately corresponds to the maximum rate of climb speed
B) The speed that corresponds to the speed for maximum climb angle
C) The speed for maximum lift coefficient
D) The speed for minimum drag

If the temperature decreases it will cause a:

A) increase in take-off distance required and a reduced maximum rate of climb
B) decrease in take-off distance required and a reduced maximum rate of climb
C) decrease in take-off distance required and an increase the maximum rate of climb
D) increase in take-off distance required and an increased maximum rate of climb

The pilot of a light twin engine aircraft has calculated a 4 000 m service ceiling, based on the forecast general conditions for the flight and a take-off mass of 3 250 kg. If the take-off mass is 3 000 kg, the service ceiling will be:

A) higher than 4 000 m
B) only a new performance analysis will determine if the service ceiling is higher or lower than 4 000 m
C) unchanged, equal to 4 000 m
D) less than 4 000 m

For a multi engine aircraft not certified under JAR 25 and in Performance Class B, service ceiling is defined as:

A) the altitude which at maximum power the rate of climb of an aircraft has fallen to 100ft per minute
B) the altitude which at maximum power the rate of climb of an aircraft has fallen to 500ft per minute
C) the altitude which at maximum power the rate of climb of an aircraft has fallen to 0ft per minute
D) the altitude which at maximum power the rate of climb of an aircraft has fallen to 100ft per minute for a piston engine and 500ft per minute for a jet aircraft

Following a take-off determined by the 50ft (15m) screen height, a light twin climbs on a 10% over-the-ground climb gradient. It will clear a 900 m high obstacle in relation to the runway (horizontally), situated at 10 000 m from the 50 ft clearing point with an obstacle clearance of:

A) 85 m
B) 115 m
C) It will not clear the obstacle
D) 100 m

The lift required for climbing flight is:
A) Equal to mass x sin (angle of climb)
B) Equal to drag x cos (angle of climb)
C) Greater than that required in level flight
D) Lower than that required in level flight

The minimum total drag of an aircraft in level flight occurs:
A) when the parasite drag is a minimum
B) when the induced drag is a minimum
C) when CD total is a minimum
D) when CL : CD is a maximum

Air density is reduced by:
A) Decreased altitude
B) Increased temperature
C) Increased speed
D) Decreased water vapour content

(CAP 698 figure 3.3)
Find the maximum permissible weight for take-off from an aerodrome with a runway length of 1000ft having no stopway or clearway, given:

Pressure altitude: sea level
Temperature: 10° C
Reported wind component: 5 kts head
A) 4100 lb
B) 4750 lb
C) 3700 lb
D) 4600 lb

On a twin engine piston aircraft with variable pitch propellers, for a given mass and altitude, the minimum drag speed is 125 kt and the holding speed (minimum fuel burn per hour) is 95 kt. The best rate of climb speed will be obtained for a speed:
A) equal to 125 kts
B) equal to 95 kts
C) < 95 kts
D) is between 95 and 125 kts

---

81. A FLAT RATED jet engine will give:
A) increasing thrust as temperature increases above a cut-off value
B) a constant thrust for temperatures above a cut-off value
C) decreasing thrust as temperature decreases below a cut-off value
D) a constant thrust for temperatures below a cut-off value

What is the effect of a 2% uphill runway slope on take-off distances?

A) ASDA increases
B) TODR increases
C) TODR decreases
D) TODA increases

The maximum horizontal speed occurs when:

A) The thrust is equal to the maximum drag
B) The thrust is equal to minimum drag
C) The maximum thrust is equal to the total drag
D) The thrust does not increase further with increasing speed

A twin engine aeroplane in cruise flight with one engine inoperative has to fly over high ground. In order to maintain the highest possible altitude the pilot should choose:

A) the long range speed
B) the speed corresponding to the maximum value of the lift / drag ratio
C) the speed at the maximum lift
D) the speed corresponding to the minimum value of lift / drag ratio

Which of the following factors will lead to an increase of ground distance during a glide, while maintaining the appropriate minimum glide angle speed?

A) Headwind
B) Increase of aircraft mass
C) Tailwind
D) Decrease of aircraft mass

Heavy rain may temporarily cause:

A) Increased stalling speed
B) All of the above
C) Increased weight
D) Reduced forward speed

What is the influence of the mass on maximum rate of climb (ROC) speed if all other parameters remain constant?

A) The ROC is affected by the mass, but not the ROC speed
B) The ROC speed decreases with increasing mass
C) The ROC and the ROC speed are independent of the mass
D) The ROC speed increases with increasing mass

If the runway is wet, the landing distance required for a dry runway:

A) must be increased by 5 percent
B) must be increased by 15 percent
C) must be increased by 50 percent
D) may be used un-factored

Two identical aeroplanes at different masses are descending at idle thrust. Which of the following statements correctly describes their descent characteristics?

A) At a given angle of attack the heavier aeroplane will always glide further than the lighter aeroplane
B) There is no difference between the descent characteristics of the two aeroplanes
C) At a given angle of attack the lighter aeroplane will always glide further than the heavier aeroplane
D) At a given angle of attack, both the vertical and the forward speed are greater for the heavier aeroplane

Deployment of flaps .... CL/CD.

A) reduces
B) only slightly increases
C) increases
D) does not affect

When taking off from a runway with a 2 percent upslope in a class B performance aircraft, the take-off distance should be increased by:

A) 7.5 percent
B) 5 percent
C) 10 percent
D) 15 percent

How does the lift coefficient for maximum range vary with altitude? (No compressibility effects.)

A) The lift coefficient increases with increasing altitude
B) Only at low speeds the lift coefficient decreases with increasing altitude
C) The lift coefficient is independent of altitude
D) The lift coefficient decreases with increasing altitude

If the net gradient of climb after take-off with all engines operating is 14 percent in the prevailing conditions, the horizontal distance required to reach a height of 1500ft from the screen, if the cloud base is 2000ft, would be:

A) 13 914 ft
B) 10 357 ft
C) 13 450 ft
D) 10 714 ft

During climb to the cruising level, a headwind component

A) increases the amount of fuel for the climb
B) decreases the ground distance flown during that climb
C) increases the climb time
D) decreases the climb time

The maximum rate of climb that can be maintained at the absolute ceiling is:
A) 100 ft/min
B) 125 ft/min
C) 0 ft/min
D) 500 ft/min

Ignoring the effect of compressibility, what would CL do with an increase in altitude?
A) Remain the same
B) Increase, then decrease
C) Increase
D) Decrease

For a turboprop powered aeroplane, a 2200 m long runway at the destination aerodrome is expected to be " wet" . The " dry runway" landing distance, should not exceed:
A) 1147 m
B) 1771 m
C) 1339 m
D) 1540 m

When flying the " Backside of Thrust curve" means
A) a thrust reduction results in an acceleration of the aeroplane
B) the thrust required is independent of the airspeed
C) a lower airspeed requires less thrust because drag is decreased
D) a lower airspeed requires more thrust

If there is a tailwind:
A) the minimum drag speed is not affected
B) the minimum drag speed is decreased by the same velocity as the wind
C) the minimum drag speed is decreased
D) the minimum drag speed is increased

The climb gradient of an aircraft after take-off is 6% in standard atmosphere, no wind, at 0 ft pressure altitude.
Using the following corrections:

± 0,2 % / 1 000 ft field elevation
± 0,1 % / ° C from standard temperature
1 % with wing anti-ice
0,5% with engine anti-ice

The climb gradient after take-off from an airport situated at 1 000 ft, 17° C; QNH 1013,25 hPa, with wing and engine anti-ice operating for a functional check is:
A) 4,3 %
B) 4,7 %
C) 3,9 %
D) 4,9 %

101. For an aircraft flying in conditions that would give the balked landing climb limit gradient of 2.5 percent, the rate of climb that would be achieved at a TAS of 90kts would be:

A) 3600 ft/min
B) 360 ft/min
C) 23 ft/min
D) 228 ft/min

The angle of attack at which most aerofoil will stall is:

A) 10°
B) 15°
C) 20°
D) 5°

What is the effect of extending flaps on climb gradient and rate of climb?

A) Climb gradient decreases and rate of climb decreases
B) Climb gradient decreases and rate of climb increases
C) Climb gradient increases and rate of climb decreases
D) Climb gradient increases and rate of climb increases

An aerodrome has a paved level runway of 5000ft. What distance should be used in the graph to calculate the maximum planned landing weight if the runway is wet (multi engine class B)?

A) 4348 ft
B) 3500 ft
C) 4025 ft
D) 3040 ft

What is the effect of runway slope on take-off performance?

A) An uphill slope increases the take-off run required
B) An uphill slope decreases the take-off run available
C) A downhill slope increases the take-off distance required
D) A downhill slope increases the take-off run available

How does a decreased pressure altitude at an airport affect aeroplane performance?

A) Decreased take-off distance required
B) Increased accelerate-stop distance
C) Increased take-off distance required
D) Increased take-off run

The maximum rate of climb speed is:

A) lower than the best angle of climb speed
B) the same as the best angle of climb speed
C) higher than the best angle of climb speed
D) as close to the stalling speed as possible

(CAP 698 figure 3.3)
What length of take-off run must be available to meet the requirements, if there is no stopway or clearway at the aerodrome, given the following conditions:

Pressure altitude: 3000 ft
Temperature: 5° C
Weight: 4150 lb
Reported wind component: 10kts head

A) 975 ft
B) 1250 ft
C) 1000 ft
D) 780 ft

What is the effect of a head wind component, compared to still air, on the maximum range speed (IAS) and the speed for maximum climb angle respectively?

A) Maximum range speed increases and maximum climb angle speed increases
B) Maximum range speed increases and maximum climb angle speed stays constant
C) Maximum range speed decreases and maximum climb angle speed decreases
D) Maximum range speed decreases and maximum climb angle speed increases

What is the effect of increased mass on the maximum rate of climb speed (all other factors considered unchanged)?

A) Speed for maximum rate of climb increases with increasing mass
B) Maximum rate of climb is dependent of mass, but not the speed for maximum rate of climb
C) Speed for maximum rate of climb decreases with increasing mass
D) Maximum rate of climb and the corresponding speed are dependent of mass

For normally aspirated reciprocating engines the brake horsepower delivered:

A) Increases with decreasing air density
B) Decreases wild increases air density
C) Decreases with decreasing air density
D) None of the above

A climb gradient required is 3,3%. For an aircraft maintaining 100 kt true airspeed , no wind, this climb gradient corresponds to a rate of climb of approximately:

A) 330 ft/min
B) 3,30 m/s
C) 33,0 m/s
D) 300 ft/min

The speed instability region is:
A) the same as the region of negative gradient of the thrust or power required curve
B) region where the aeroplane can not be flown manually
C) area above the intersection of power required curve and drag curve
D) located in the area below the low speed buffet

Where the ambient temperature is -34° C at a pressure altitude of 33 000 feet the ISA deviation is:
A) +16° C
B) -16° C
C) -17° C
D) +17° C

If the climb gradient in still air 3.2 percent, the height achieved is 640ft, what is the distance travelled in the climb in still air?
A) 5,68 NM
B) 2,72 NM
C) 2,03 NM
D) 3,29 NM

Which of the following factors favours the selection of a low flap setting for the take-off?
A) Low field elevation, close-in obstacles in the climb-out path, long runway and a high ambient temperature
B) Low field elevation, no obstacles in the climb-out path, short runway and a low ambient temperature
C) High field elevation, distant obstacles in the climb-out path, long runway and a high ambient temperature
D) High field elevation, no obstacles in the climb-out path, low ambient temperature and short runway

Which of the following statements is true with respect to the take-off flight path (multi engine class B)?
A) The angle of bank may not be assumed to exceed 15 degrees after the 50ft screen
B) Reported winds are not required to be factored
C) If the change of heading exceeds 15 degrees, obstacles at a lateral distance from the track in IMC of greater than 600m need not be considered
D) Obstacles must be cleared by at least 35f

For a turbo-prop aircraft, the LDA at an aerodrome is 2200 m. If the conditions are indicated as wet, what would the equivalent dry LDA be?
A) 1913 m
B) 1451 m
C) 1538 m
D) 1317 m

To achieve the maximum range over ground with headwind the airspeed should be
A) higher compared to the speed for maximum range cruise with no wind
B) equal to the speed for maximum range cruise with no wind
C) lower compared to the speed for maximum range cruise with no wind
D) reduced to the gust penetration speed

Considering a turbine powered aircraft, when passing 35 feet at the end of the take-off distance, the speed should not be less than
A) Vmcg
B) 1.3 Vmcg
C) Vs1 or 1.3 Vmcg
D) Vs1 or 1.1 Vmca

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121. The take-off distance of an aircraft is 600m in standard atmosphere, no wind at 0 ft pressure-altitude. Using the following corrections:

± 20 m / 1 000 ft field elevation
5 m / kt headwind
+ 10 m / kt tail wind
± 15 m / % runway slope
± 5 m / ° C deviation from standard temperature

The take-off distance from an airport at 1 000 ft elevation, temperature 17° C, QNH 1013,25 hPa, 1% up-slope, 10 kt tail wind is:
A) 555 m
B) 755 m
C) 685 m
D) 715 m

An aerodrome has a pressure of 1013 mb and a temperature of 25° C, the pressure altitude (i) and the density altitude (ii) would be:
A) (i) Sea level (ii) Sea level
B) (i) sea level (ii) above sea level
C) (i) above sea level (ii) below sea level
D) (i) below sea level (ii) above sea level

Which of the following variables does not affect the value of Vmc?
A) Weight
B) Altitude
C) Temperature
D) Increased engine power

Use of performance graphs and tabulated data:

The balked landing climb requirement must be met in the following configuration (Class B multi engine):

A) Gear up, approach flap, maximum continuous power on all engines
B) Gear down, landing flap, take off power with one engine inoperative
C) Gear down, approach flap, maximum continuous power on all engines
D) Gear down, landing flap, take off power on all engines

(Refer to CAP698 figure 3.7)
Given:
Pressure Altitude: 4000 ft
Temperature: ISA +17° C
Take-off mass: 4000 lbs
Determine the rate of climb with both engines operating:

A) 1900 ft/min
B) 1350 ft/min
C) 1550 ft/min
D) 325 ft/min

(Refer to CAP 698 figure 3.7)
Given:
Pressure Altitude: 14 000 ft
Temperature: ISA +15Â° C
Take-off mass: 4750 lbs
Determine the rate of climb with both engines operating:

A) 625 ft/min
B) 750 ft/min
C) 1550 ft/min
D) 800 ft/min

If pressure altitude increases, the power required curve of aeroplane:

A) moves up and to the right
B) moves horizontally right
C) moves down and to the left
D) moves to the left

(Refer to CAP698 figure 3.7)
Given:
Pressure Altitude: 4000 ft
Temperature: ISA +17° C
Take-off mass: 4000 lbs
Determine the rate of climb with one engine inoperative:

A) 175 ft/min
B) 1550 ft/min
C) 325 ft/min
D) 350 ft/min

(Refer to CAP698 figure 3-2)
Given:
Pressure Altitude: 4000 ft
Temperature: ISA +17° C
Take-off mass: 4300 lbs
Wind: 4 kts tail
Determine the Accelerate Stop Distance:

A) 3900 ft
B) 4800 ft
C) 4150 ft
D) 4500 ft

If the mass of an aircraft is increased, the power required curve:

A) Moves down and to the left
B) Moves horizontally right
C) Moves up and to the right
D) Is not affected

(For this Question use CAP 698 Figure 3.4)
With regard to the graph for the light twin aeroplane, will the accelerate and stop distance be achieved in a take- off where the brakes are released before take-off power is set?

A) No, the performance will be worse than in the chart
B) Performance will be better than in the chart
C) It does not matter which take-off technique is being used
D) Yes, the chart has been made for this situation

(Refer to CAP 698 figure 2-4)
Given:
Flaps: 40°
Aerodrome pressure altitude: sea level
Ambient temperature: +15° C
Landing weight: 4 000 lb
Wind: calm
Runway: wet grass
What is the Landing Distance Required?

A) 2 040 feet
B) 1 400 feet
C) 1 240 feet
D) 2 345 feet

Considering a rate of climb diagram (ROC versus TAS) for an aeroplane. In which direction does the curve for FLAPS DOWN move compared to CLEAN configuration?

A) Left and Down
B) Left and horizontally
C) Left and Up
D) Right and Up

(Refer to CAP 698 figures 3-5 & 3-6)
Multi-engine piston aircraft of performance class B. Using the relevant graphs and tables in the CAP 698 (MEP1) and given:
Outside Air Temperature: +22° C
Pressure Altitude: 4000 ft
Gross TO Weight: 4750 lbs
Climb speed: 92 KIAS
Cloud Base: 1000 ft above reference zero
Wind: 15kts headwind
There is an obstacle at 8500 ft from TODR in the obstacle domain which has a height of 750 ft above reference zero. How much will you clear it by?

A) 270 ft
B) 50 ft
C) 265 ft
D) You will not clear it

(Refer to CAP 698 figure 2-1)
Given:
Flaps: UP
Aerodrome pressure altitude: 6 000 ft
Ambient temperature: +20° C
Take-off weight: 3400 lb
Headwind component: 10 kt
Runway: 1% downhill; wet grass
What is the TOD?

A) 2 210 feet
B) 1 615 feet
C) 3 120 feet
D) 1 700 feet

The flight manual of a light twin engine recommends two cruise power settings, 65 and 75%. The 75% power setting in relation to the 65% results in:

A) an increase in speed and fuel-burn/distance, but an unchanged fuel-burn per hour
B) an increase in speed, fuel consumption and fuel-burn/distance
C) same speed and fuel-burn/distance, but an increase in the fuel-burn per hour
D) same speed and an increase of the fuel-burn per hour and fuel-burn/distance

(Refer to CAP698 figure 3.7)
Given:
Pressure Altitude: 14 000 ft
Temperature: ISA +15° C
Take-off mass: 4750 lbs
Determine the rate of climb with one engine inoperative:

A) 100 ft/min
B) zero ft/min
C) 50 ft/min
D) less than zero ft/min

Performance Class A – JAA/FAA 25 certified

Take-off:

What effect, if any, does high humidity have on aircraft performance?

A) It decreases aeroplane performance
B) All of the above
C) It has no effect on aeroplane performance
D) It increases aeroplane performance

Maximum and minimum values of V1 are limited by:

A) VR and VMCG
B) V2 and VMCA
C) V2 and VMCG
D) VR and VMCA

When an aircraft takes off with the mass limited by the TODA:

A) the " balanced take-off distance" equals 115% of the " all engine take-off distance"
B) the end of the runway will be cleared by 35 feet following an engine failure at V1
C) the distance from brake release to V1 will be equal to the distance from V1 to the 35 feet point
D) the actual take-off mass equals the field length limited take-off mass

At a given aerodrome the runway length, pressure altitude and OAT, as well as other data are known, and the flap setting for takeoff is selected to be flaps 10° to get maximum possible takeoff weight at this aerodrome. As the aircraft departs, the flap handle is erroneously set to 20° . Now the takeoff performance:

A) vs RWY increases
B) vs climb requirement increases
C) vs service ceiling increase
D) vs OBST increases (determined by a distant obstacle)

If not VMBE or Vmcg limited, what would V1 be limited by:

A) V2
B) Vmca
C) VMU
D) VR

Which of the following statements is correct :

A) If the aircraft is rotated before VR to the normal attitude, the take off distance required will be reduced
B) If the aircraft is rotated after VR to the normal attitude, the take off distance required will be increased
C) If the aircraft is rotated after VR to a greater than normal attitude, the take off distance will be reduced
D) If the aircraft is rotated before VR to a greater than normal attitude, the take off distance required will be reduced

The take-off distance required increases:
A) due to head wind because of the drag augmentation
B) due to downhill slope because of the smaller angle of attack
C) due to slush on the runway
D) due to lower gross mass at take-off

In case of an engine failure which is recognized at or above V1:
A) the take-off should be rejected if the speed is still below VR
B) the take-off must be continued
C) the take-off must be rejected if the speed is still below VLOF
D) a height of 50 ft must be reached within the take-off distance

The effect on a too late rotation will be an:
A) decrease both the ground roll and climb ability
B) increase the ground roll and decrease the climb ability
C) increase the ground roll but climb ability will be good
D) decrease the ground roll but increase the climb ability

Which of the following relations is correct?
A) VMU < VMCA < V1
B) VS < VMCA < V2MIN
C) V2MIN < VMCA < VMU
D) VR < VMCA < VLOF

The effect of a runway contaminated with 0.5 cm of slush on take-off calculations would be to decrease the TOM,...
A) increase the V1 and increase VR
B) decrease V1 with the same VR
C) with the same V1 and increase VR
D) decrease V1 and decrease VR

Wet snow is comprised of:
A) a mixture of water and snow
B) loose hard snow in the form of pellets
C) snow which has been compressed
D) loose snow in the form of large flakes

Can take-off be scheduled if V1 < VMCG?
A) No
B) Yes
C) Only if V1 is decreased to equal VMCG
D) Only if VMCG is decreased to equal V1

If the take-off mass of an aeroplane is brake energy limited a higher uphill slope would:

A) increase the maximum mass for take-off
B) decrease the required take-off distance
C) decrease the maximum mass for take-off
D) have no effect on the maximum mass for take-off

The speed V2 of a jet aeroplane must be greater than:

A) 1.3V1
B) 1.05VLOF
C) 1.2Vs
D) 1.2VMCG

The Take off Distance Required on a dry runway is :

A) the distance to reach 15 ft with the critical engine having failed at VEF
B) 115% of the distance to 35 ft the critical engine having failed at VEF
C) the distance to reach 35 ft with all engines operating
D) the greater of the distance to reach 35 ft with the critical engine having failed at VEF and 115% of the distance to reach 35 ft with all engines operating

(Refer to CAP 698 Figure 4.4)
Find the field length limited take-off mass given the following data:
Pressure altitude: 2500 ft
Take off flap: 5°
Temperature: 30° C
Air conditioning: Off
Balanced field length available: 6000 ft
PMC: On
Reported wind component: 25 kt headwind
Runway slope: level

A) 53.500 kg
B) 55.000 kg
C) 55.820 kg
D) 53.750 kg

What are the minimum and maximum values of V1?

A) VS, V2
B) VMCA, V3
C) VMCG, VNE
D) VMCG, VR

VR for a jet aircraft must be faster than, the greater of:

A) V1 and 1.1 Vmca
B) VMBE and V1
C) Vmca and 1.1V1
D) 1.05 Vmca and V1

For a take-off from a contaminated runway, which of the following statements is correct?

A) The greater the depth of contamination at constant take-off mass, the more V1 has to be decreased to compensate for decreasing friction
B) The performance data for take-off must be determined in general by means of calculation, only a few values are verified by flight tests
C) Dry snow is not considered to affect the take-off performance
D) A slush covered runway must be cleared before take-off, even if the performance data for contaminated runway is available

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21. Assuming identical runway slope and wind component values, which of the following combinations will give the most limiting take-off mass?

A) a downhill slope runway and a headwind component
B) an uphill slope runway and a tailwind component
C) a downhill slope runway and a tailwind component
D) an uphill slope runway and a headwind component

When operating with anti-skid inoperative:

A) both take-off and landing performance will be affected
B) neither take-off nor landing performance will be affected
C) only landing performance will be affected
D) only take-off performance will be affected

VR cannot be lower than:

A) 1.2 Vs for twin and three engine jet aeroplane
B) 1.15 Vs for turbo-prop with three or more engines
C) 105% of V1 and VMCA
D) V1 and 105% of VMCA

Uphill slope:

A) increases the allowed take-off mass
B) increases the take-off distance more than the accelerate stop distance
C) decreases the take-off distance only
D) decreases the accelerate stop distance only

With a decreased flap setting from 20° to 10° on take off the effect will be:

A) VLOF would increase but V2 would decrease
B) VLOF would decrease
C) VLOF and V2 would both increase
D) VLOF would decrease and V2 would increase

Vr for transport category aircraft must be at least:

A) less than V1
B) 1.05 x Vth
C) 1.2 x Vmca
D) 1.05 x Vmca

The vertical clearance of obstacles required on the take off flight path is:

A) 35 ft for all flight paths
B) 35 ft, or 50 ft during a turn in which the bank exceeds 15°
C) 35 ft for the net flight path, and 50 ft for the gross flight path
D) 50 ft for all flight paths

If takeoff weight is limited by Climb Requirements (A/C weight > 5700kg), then it means:

A) That the A/C will not be able to climb to its filed cruising level at a higher weight (all engines operating)
B) That the presence of obstacles along the departure flight path is limiting the T/O weight
C) That a higher weight at constant climb cannot be maintained up to 5000 feet pressure altitude
D) That at higher T/0 weight certain climb gradients during the T/O climb cannot be attained in case of an engine failure

If a V1 in excess of the calculated value is used for take-off then:

A) The abandoned take-off option is not permitted
B) VR will also be increased
C) The continued take-off option is not permitted
D) Both continued and abandoned take-off options are not permitted

During certification testing of a two-engine jet aircraft, the true take-off distances were found to be:
1547m with all power units operating
1720m with the critical engine inoperative at V1
The distance used for certification purposes would be:

A) 1547m
B) 1720m
C) 1779m
D) 1978m

Which of the following statements is correct?

A) A stopway means an area beyond the take-off runway, able to support the aeroplane during an aborted take-off
B) A clearway is an area beyond the runway which can be used for an aborted take-off
C) An under run is an area beyond the runway end which can be used for an aborted take-off
D) If a clearway or a stopway is used, the lift-off point must be attainable at least at the end of the permanent runway surface

Take off run required for a jet aircraft, with one engine inoperative is:

A) the same as for all engines
B) brake release point to 15ft
C) brake release point to 35ft
D) brake release point to midpoint between VLOF and 35ft

Which of the following will not cause the climb limited take-off weight to decrease:

A) Increased headwind component
B) Increased flap setting angle
C) Increased ambient temperature
D) Increased aerodrome pressure altitude

Runway 02 has a threshold elevation of 230 ft and runway 20 has a threshold elevation of 260ft. If the TORA is 1200m calculate the slope of runway 02:

A) 0.76% down
B) 1.56% down
C) 0.76% up
D) 1.56% up

What will be the effect on an aeroplanes performance if aerodrome pressure altitude is decreased?

A) It will increase the take-off ground run
B) It will increase the accelerate stop distance
C) It will increase the take-off distance required
D) It will decrease the take-off distance required

During certification flight testing on a four engine turbojet aeroplane the actual take-off distances measured are:
3050 m with failure of the critical engine recognised at V1
2555 m with all engines operating and all other things being equal
The take-off distance adopted for the certification file is:

A) 2938 m
B) 3050 m
C) 3513 m
D) 2555 m

Other factors remaining constant and not limiting, how does increasing pressure altitude affect allowable take-off mass?

A) Allowable take-off mass remains uninfluenced up to 5000 ft PA
B) There is no effect on allowable take-off mass
C) Allowable take-off mass increases
D) Allowable take-off mass decreases

Which one of the following is not affected by a tail wind?

A) the field limited take-off mass
B) the take-off run
C) the obstacle limited take-off mass
D) the climb limited take-off mass

When take off mass is limited by VMBE, an increase in the uphill slope will:

A) allow an increase in the mass
B) decrease the TODR
C) have no affect
D) require a decrease in the mass

The take-off mass could be limited by:

A) the take-off distance available (TODA), the maximum brake energy and the climb gradient with one engine inoperative
B) the maximum brake energy only
C) the take-off distance available (TODA) only
D) the climb gradient with one engine inoperative only

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41. If the balanced field length required for a given weight is less than the balanced field length available :

A) Take off may not be made at that weight
B) the V1 must be increased above the balanced field V1
C) the V1 must be decreased below the balanced field V1
D) there will be a range of V1 speed available

The speed V1 may never exceed:

A) the minimum control speed ground (Vmcg)
B) the rotation speed (Vr)
C) the maximum braking energy speed (Vmbe)
D) both 2 and 3

What is the advantage of balancing V1, even in the event of a climb limited take-off?

A) The accelerate stop distance required is the shortest
B) The safety margin with respect to the runway length is greatest
C) The take-off distance required with one engine out at V1 is the shortest
D) The climb limited take-off mass is the highest

Balanced V1 is selected:

A) for a runway length limited take-off. with a stopway to give the highest-mass
B) if it is equal to V2
C) for a runway length limited take-off with a clearway to give the highest mass
D) if the accelerate stop distance is equal to the one engine out take-off distance

The time delay included in take-off calculations for the recognition and reaction to an engine failure during the take-off run is:

A) 1 seconds
B) 3 seconds
C) 4 seconds
D) 2 seconds

The one engine out take-off run is the distance between the brake release point and:

A) the lift-off point
B) the middle of the segment between VLOF point and 35 ft point
C) the point where V2 is reached
D) the point half way between V1 and V2

Water equivalent depth is:
A) the depth of water in the contaminant
B) the contaminant depth x specific gravity
C) the contaminant depth x 0.5
D) the measured depth of the contaminant

Select the correct sequence of speeds :
A) VEF < V1 < VMCG < VR
B) VMCG < VEF < VR < V1
C) VMCG < V1 = VEF < VR
D) VMCG < VEF < V1 < VR

Which of the following is true with regard to VMCA (air minimum control speed)?
A) VMCA only applies to four-engine aeroplanes
B) Straight flight can not be maintained below VMCA, when the critical engine has failed
C) The aeroplane will not gather the minimum required climb gradient
D) The aeroplane is uncontrollable below VMCA

During certification test flights for a turbojet aeroplane, the actual measured take-off runs from brake release to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 feet above the take-off surface are:
1747 m, all engines operating
1950 m, with the critical engine failure recognized at V1,

the other factors remaining unchanged. Considering both possibilities to determine the take-off run (TOR). What is the correct distance?
A) 2096 m
B) 2243 m
C) 1950 m
D) 2009 m

The take-off safety speed V2min for turbo-propeller powered aeroplanes with more than three engines may not be less than:
A) 1.3 Vs
B) 1.2 Vs
C) 1.2 Vs1
D) 1.15 Vs

Reduced take-off thrust:
A) is not recommended at very low temperatures (OAT)
B) can be used if the actual take-off mass is higher than the performance limited take-off mass
C) has the benefit of improving engine life
D) can be used if the headwind component during take-off is at least 10 kt

What is the effect of a negative runway slope?

A) V1 increases
B) VR decreases
C) VR increases
D) V1 decreases

Putting in 16500 litres of fuel with an SG of 780 kg/m3, and writing 16500 kg of fuel on the load sheet will result in:

A) TOD and ASD decreasing, and the calculated V2 being too fast
B) TOD increasing and ASD decreasing, and the calculated V2 being too fast
C) TOD and ASD remaining constant, if the calculated speeds are used
D) TOD and ASD increasing, if the calculated speeds are used

Which of the following combinations will most likely cause the greatest increase in the take-off distance?

1. Tailwind
2. Headwind
3. Upslope
4. Downslope
5. High temperature
6. Low Temperature

A) 1, 4, 5
B) 2, 4, 5
C) 1, 3, 5
D) 2, 4, 6

The clearway is defined as:

A) an area beyond the runway, not less than 500ft wide, centrally located about the extended centreline of the runway, and under the control of the airport authorities
B) an area at the end of the stopway which can only be used in TODA calculations
C) an area which must not exceed TODA by more than 15 percent
D) a rectangular area 90 ft either side of the centreline on the ground at the end of the runway and in the direction of take-off

Regarding the obstacle limited take-off mass, which of the following statements is correct?

A) The maximum bank angle which can be used is 10°
B) Wind speed plays no role when calculating this particular mass
C) A take-off in the direction of an obstacle is also permitted in tail wind condition
D) The obstacle limited mass can never be lower than the climb limited take-off mass

A runway is considered to be contaminated when:
A) more than 30% of the runway surface is covered by more than a 3 mm depth of water
B) more than 25% of the runway surface is covered by more than a 3 mm depth of water
C) more than 50% of the runway surface is covered by more than a 5 mm depth of water
D) more than 25% of the runway surface is covered by more than a 2.5 mm depth of water

Clearway may not exceed:
A) 150% ASDA
B) 50% TODA
C) 50% ASDA
D) 50% TORA

Increase in ambient temperature will result in:
A) increase of climb limited mass
B) increased obstacle limited mass
C) increased field length limited mass
D) decrease of maximum brake energy limited mass

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61. If the value of the balanced V1 is found to be lower than VMCG, which of the following is correct?
A) The one engine out take-off distance will become greater than the ASDR
B) The take-off is not permitted
C) The VMCG will be lowered to V1
D) The ASDR will become greater than the one engine out take-off distance

Which is the correct sequence of speeds during take-off?
A) VMCG, V1, VR, V2
B) V1, VMCG, VR, V2
C) V1, VR, V2, VMCA
D) V1, VR, VMCG, V2

The length of a clearway may be included in:
A) the distance to reach V1
B) the accelerate-stop distance available
C) the take-off distance available
D) the take-off run available

Can the length of a stopway be added to the runway length to determine the take-off distance available?
A) Yes, but the stopway must have the same width as the runway
B) No, unless its centreline is on the extended centreline of the runway
C) No
D) Yes, but the stopway must be able to carry the weight of the aeroplane

The definition of V3 is:

A) 1.15 x VS
B) The aircraft speed on all engines as it passes through the screen height
C) The all engines target speed for the climb to flap retraction height
D) 1.3 x VS

A higher outside air temperature (OAT):

A) decreases the brake energy limited take-off mass
B) increases the climb limited take-off mass
C) increases the field length limited take-off mass
D) decreases the take-off distance

During the flight preparation the climb limited take-off mass (TOM) is found to be much greater than the field length limited TOM using 5° flap. In what way can the performance limited TOM be increased? There are no limiting obstacles.

A) By selecting a higher flap setting
B) By selecting a lower V2
C) By selecting a lower flap setting
D) By selecting a higher V2

Which statement related to a take-off from a wet runway is correct?

A) The use of a reduced VR is sufficient to maintain the same safety margins as for a dry runway
B) In case of a reverser inoperative the wet runway performance information can still be used
C) A reduction of screen height is allowed in order to reduce weight penalties
D) Screen height reduction can not be applied because of reduction in obstacle clearance

Considering the undercarriage assembly, the factors that limit aircraft performance are...

A) wheel rotation speed and brake energy
B) wheel rotation speed only
C) brake energy only
D) tyre pressure only

Which factors might cause V2 to be limited by VMCA?

i. large flap angles
ii. small flap angles
iii. high air pressure
iv. low air pressure
v. high aircraft weights
vi. low aircraft weights

A) (i), (iii) and (v)
B) (i), (iii) and (vi)
C) (iv) and (vi)
D) (ii), (iii) and (v)

If the actual take off weight is higher than that recorded on the load sheet, what would the pilot be surprised by?

A) Higher unstick speed than expected
B) Higher stick forces than expected
C) Higher climb gradient than expected
D) Higher V1 than expected

Take-off run is defined as the:

A) distance to 35 feet with an engine failure at V1 or 115% all engine distance to 35 feet
B) Distance from brake release to V2
C) horizontal distance along the take-off path from the start of the take-off to a point equidistant between the point at which VLOF is reached and the point at which the aeroplane is 35 ft above the take-off surface
D) distance to V1 and stop, assuming an engine failure at V1

The rolling friction drag of an aircrafts wheels during take-off:

A) Depends on tyre distortion and increases with speed
B) Depends on the wheel bearing friction and increases with speed
C) Depends on the aircraft weight and is constant during take-off
D) Depends on the total load on the wheels and decreases during take-off

The TODA is:

A) declared runway length plus stopway
B) declared runway length only
C) declared runway length plus clearway and stopway
D) declared runway length plus clearway

What is TODA?

A) TORA plus stopway plus clearway
B) always equal to ASDA
C) TORA plus stopway
D) TORA plus clearway

A reduction in air density causes:

A) An increase in CL
B) A decrease in take-off distance
C) An increase in take-off distance
D) A decrease in CL

What procedure is likely to require V1 to be reduced?

A) The improved climb procedure
B) When ASDA is greater than TODA
C) A reduced thrust take-off
D) A take-off with anti-skid inoperative

Which statement regarding the influence of a runway down-slope is correct for a balanced take-off? Down- slope...

A) reduces V1 and increases the accelerate stop distance required (ASDR)
B) increases V1 and increases the take-off distance required (TODR)
C) reduces V1 and reduces take-off distance required (TODR)
D) increases V1 and reduces the accelerate stop distance required (ASDR)

Which statement regarding V1 is correct?

A) VR may not be lower than V1
B) The correction for up-slope on the balanced V1 is negative
C) V1 may not be higher than Vmcg
D) When determining V1, reverse thrust may only be used on the remaining symmetric engines

Which of the following answers is true?

A) V1 > VR
B) V1 > Vlof
C) V1 < = VR
D) V1 < VMCG

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81. The lowest take-off safety speed (V2 min) is:

A) 1.20 Vs for all turbojet aeroplanes
B) 1.15 Vs for all turbojet aeroplanes
C) None of the above
D) 1.15 Vs for four-engine turboprop aeroplanes and 1.20 Vs for two or three-engine turboprop aeroplanes

VR must be:

A) greater than 1,05 VMCA and not less than V1
B) greater than VMCA and greater than 1,1 V1
C) between 1,05 VMCA and V1
D) no greater than 0,95 VMU

If a balanced field is used for take-off calculations when the actual field distances are unbalanced, this will:

A) have no effect on the take-off mass
B) increase the minimum permissible take-off mass
C) improve the maximum permissible take-off mass
D) decrease the maximum allowable take-off mass

The safety margin included in the take-off graphs for Class A aeroplane calculations with all engines operating is:

A) 30%
B) 23%
C) 20%
D) 13%

During the take-off run the thrust of a jet engine:

A) ls increased due to increasing intake ram temperature rise
B) ls decreased due to ram effect
C) ls increased due to intake momentum drag
D) ls decreased due to reducing difference between jet velocity and aircraft velocity

May anti-skid be considered to determine the take-off and landing data?

A) Only for landing
B) Only for take-off
C) Yes
D) No

At the moment of lift off for a Class A aeroplane the:

A) Lift will be greater than mass
B) Lift will equal the mass
C) Lift will equal drag
D) Rolling resistance is at a maximum

The climb limited take-off mass can be increased by:

A) selecting a lower V1
B) a lower flap setting for take-off and selecting a higher V2
C) selecting a lower VR
D) selecting a lower V2

In which of the following distances can the length of a stopway be included?

A) In the take-off run available
B) In the accelerate stop distance available
C) In the one-engine failure case, take-off distance
D) In the all-engine take-off distance

The speed Vmu is (class A):

A) the minimum speed at which the elevators can rotate the aircraft until the tail skid is in contact with the runway
B) the minimum speed at which the aircraft can safely lift off the ground
C) the maximum speed for flight with the undercarriage extended
D) the maximum speed at which the aircraft should become airborne

A frangible obstacle in the take-off path:

A) will limit stopway length
B) must be taken into account for performance calculations
C) is never allowed
D) will present a minimum hazard to an aircraft on impact

During the flight preparation a pilot makes a mistake by selecting a V1 greater than that required. Which problem will occur when the engine fails at a speed immediately above the correct value of V1?

A) The stop distance required will exceed the stop distance available
B) V2 may be too high so that climb performance decreases
C) It may lead to over-rotation
D) The one engine out take-off distance required may exceed the take-off distance available

The effect of a higher take-off flap setting up to the optimum is:

A) an increase of the field length limited take-off mass but a decrease of the climb limited take-off mass
B) a decrease of the field length limited take-off mass but an increase of the climb limited take-off mass
C) an increase of both the field length limited take-off mass and the climb limited take-off mass
D) a decrease of both the field length limited take-off mass and the climb limited take-off mass

During aircraft certification, the value of VMCG is found with nose wheel steering inoperative. This is because:

A) nose wheel steering does not affect VMCG
B) the aircraft may be operated even if the nose wheel steering is inoperative
C) VMCG must be valid in both wet and dry conditions
D) nose wheel steering does not work after an engine failure

The speed VR:

A) must be higher than VLOF
B) is the speed at which rotation to the lift-off angle of attack is initiated
C) must be equal to or lower than V1
D) must be higher than V2

Assuming that the acceleration is constant during the take-off, if the take-off speed is increased by 3%, the Take-off distance will increase by:

A) 6%
B) 12%
C) 9%
D) 3%

If the flap setting is changed from 10º to 20º , V2MIN will:

A) decrease if not limited by VMC
B) increase
C) remain the same
D) increase or decrease

Vmu is defined as:

A) max recovery speed
B) max brake energy speed
C) max dive speed
D) minimum unstick speed

If the field length limited take off mass has been calculated using a Balanced Field Length technique, the use of any additional clearway in take off performance calculations may allow:

A) the obstacle clearance limit to be increased with an higher V1
B) a greater field length limited take off mass but with a higher V1
C) a greater field length limited take off mass but with a lower V1
D) the obstacle clearance limit to be increased with no effect on V1

For a class A aircraft the rotation speed VR must not be less than :

A) 10% above VMU
B) 5% above V1
C) 10% above VMC
D) 5% above VMC

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101. The decision speed at take-off (V1) is the calibrated airspeed:

A) below which the take-off must be continued
B) at which the failure of the critical engine is expected to occur
C) at which the take-off must be rejected
D) below which take-off must be rejected if an engine failure is recognized, above which take-off must be continued

At the same aircraft mass if a higher V1 was used then...

A) TODR will decrease and ASDR increase
B) TODR and ASDR will increase
C) TODR will be unaffected and ASDR will increase
D) TODR will increase and ASDR decrease

A balanced field length occurs when:

A) VGO = VSTOP = V1
B) the take-off distance and half the clearway equals ASDA
C) the distance to accelerate to V1 and the distance to stop are identical
D) ASDA equals TODA

The required Take-off Distance (TOD) and the field length limited Take-off Mass (TOM) are different for the zero flap case and take-off position flap case. What is the result of flap setting in take-off position compared to zero flap position?

A) Increased TOD required and increased field length limited TOM
B) Decreased TOD required and decreased field length limited TOM
C) Decreased TOD required and increased field length limited TOM
D) Increased TOD required and decreased field length limited TOM

If the aircraft takes off at the wet V1 instead of the dry V1, what is the effect on (i) TODR (ii) Climb performance?

A) (i) TODR increases, (ii) Climb performance degraded
B) (i) TODR decreases, (ii) Climb performance degraded
C) (i) TODR decreases, (ii) Climb performance improved
D) (i) TODR increases, (ii) Climb performance improved

Reduced take-off thrust should normally not be used when:

A) the runway is wet
B) anti skid is not usable
C) the OAT is ISA +10° C
D) it is dark

The operational regulations regarding scheduled performance are contained in the following document:

A) Joint Airworthiness Requirements (JAR 23)
B) Joint Airworthiness Requirements - Operations (JAR-OPS)
C) Federal Aviation Requirements (FAR 25)
D) Joint Airworthiness Requirements (JAR 25)

The maximum depth of wet snow that the CAA recommends does not cover any part of the runway for flying operations to continue should not exceed is:

A) 0.5 cm
B) 30 mm
C) 13 mm
D) 10 mm

The semi-width of the stopway is:

A) 60m
B) 90m
C) no less than the associated runway
D) 75m

Which of the following represents the maximum value for V1 assuming max tyre speed and max brake energy speed are not limiting?

A) VR
B) VMCA
C) VREF
D) V2

Which of the following sequences represents the correct order on take-off?

A) VMCG, V1, VR, V2
B) VMCG, VR, V1, V2
C) VMCG, V1, VMCA, VR
D) V1, VMCA, VR, V2

How does runway slope affect allowable take-off mass, assuming other factors remain constant and not limiting?

A) Allowable take-off mass is not affected by runway slope
B) A downhill slope decreases allowable take-off mass
C) An uphill slope increases take-off mass
D) A downhill slope increases allowable take-off mass

Which are the two most important parameters to determine the value of VMCG?

A) Engine thrust and air density
B) Air density and rudder deflection
C) Engine thrust and flap setting
D) Engine thrust and rudder deflection

If the aerodrome pressure altitude increases, VR... and Vlof...

A) decreases, increases
B) decreases, decreases
C) increases, increases
D) increases, decreases

With regard to a take-off from a wet runway, which of the following statements is correct?

A) When the runway is wet, the V1 reduction is sufficient to maintain the same margins on the runway length
B) Screen height cannot be reduced
C) In case of a reverser inoperative the wet runway performance information can still be used
D) The screen height can be lowered to reduce the mass penalties

In case of an engine failure recognized below V1:

A) the take-off should only be rejected if a stopway is available
B) the take-off may be continued if a clearway is available
C) the take-off is to be continued unless V1 is less than the balanced V1
D) the take-off must be rejected

The maximum reduction in thrust permitted, when performing a reduced thrust take-off, is... percent of that required for a normal take-off.

A) 30
B) 25
C) 15
D) 50

Compared with still air, a tailwind will cause the value of V1 to:

A) remain unchanged
B) a take-off with tailwind is not permitted
C) increase
D) decrease

A balanced field exists if:

A) TODA = ASDA
B) TORA = EDA
C) TODA is greater than EDA
D) TORA = TODA

The maximum length of stopway is not limited by:

A) A ditch or depression
B) A deterioration of the load bearing strength
C) The first upstanding non-frangible obstacle
D) 50 percent of the runway length

For a contaminant to be considered significant its depth must exceed:

A) 12mm of dry snow
B) 8mm of wet snow
C) 6mm of slush
D) 3 mm of water

How is V2 affected if T/O flaps 20° is chosen instead of T/O flaps 10° ?

A) V2 has the same value in both cases
B) V2 increases in proportion to the angle at which the flaps are set
C) V2 decreases if not restricted by VMCA
D) V2 has no connection with T/O flap setting, as it is a function of runway length only

How is V2 affected if T/O flaps 20° is chosen instead of T/O flaps 10° ?

A) V2 has the same value in both cases
B) V2 increases in proportion to the angle at which the flaps are set
C) V2 decreases if not restricted by VMCA
D) V2 has no connection with T/O flap setting, as it is a function of runway length only

At an airfield which has a high absolute humidity compared to an airfield with low absolute humidity:

A) the aircraft will produce more thrust because mass flow is increased
B) the aircraft will produce less thrust because the density is reduced
C) the thrust will not be affected
D) the aircraft will produce more thrust because the water vapour cools the engines

It is recommended that the maximum crosswind for take-off on a contaminated surface is:

A) 20kts
B) 5kts
C) 15kts
D) 10kts

For a given wind speed, the regulations on wind factor give the least margin of safety on take-off:

A) if the wind is at 90° to the runway
B) if the wind is a pure headwind
C) if the wind is a pure tailwind
D) if the wind is at 45° to the runway

An airport has a 3000 metres long runway, and a 2000 metres clearway at each end of that runway. For the calculation of the maximum allowed take-off mass, the take-off distance available cannot be greater than:

A) 5000 metres
B) 4000 metres
C) 6000 metres
D) 4500 metres

Which statement, in relation to the climb limited take-off mass of a jet aeroplane, is correct?

A) The climb limited take-off mass is determined at the speed for best rate of climb.
B) The climb limited take-off mass decreases with increasing OAT.
C) On high elevation airports equipped with long runways the aeroplane will always be climb limited.
D) 50% of a head wind is taken into account when determining the climb limited take-off mass.

The minimum value of V2 (class A):

A) must not be less than 1,1Vlof or 1,2Vs
B) must not be less than 1,1Vmc or 1,2Vs
C) must not be less than 1,1Vs of 1,2Vmc
D) must not be less than 1,1Vmu or 1,2Vs

How does the slush thickness affect the required V1 reduction?

A) smaller reduction if thicker
B) there is no effect at all
C) greater reduction if thicker
D) there is no effect if mass is reduced

Take off is to be made with the anti skid system inoperative. Compared to normal operation from the same aerodrome in the same ambient conditions, the maximum take off mass (i) the V1 speed (ii) and the accelerate- stop distance (iii) would:

A) (i) decrease (ii) decrease (iii) remain the same
B) (i) decrease (ii) increase (iii) increase
C) (i) decrease (ii) decrease (iii) decrease
D) (i) increase (ii) decrease (iii) decrease

Which of the following represents the minimum for V1?

A) VLOF
B) VR
C) VMCG
D) VMU

Reduced take-off thrust should normally not be used when:

A) the runway is dry
B) the runway is wet
C) it is dark
D) windshear is reported on the take-off path

Which combination of circumstances or conditions would most likely lead to a tyre speed limited take-off?

A) A low runway elevation and a cross wind
B) A high runway elevation and a head wind
C) A low runway elevation and a head wind
D) A high runway elevation and tail wind

(CAP 698 Figure 4.9)
For the following aerodrome conditions, a take off mass of 62000 kg has been determined.
Pressure altitude: 3000 ft
Take off flap: 15°
Temperature: 20° C
Air conditioning: Auto
Reported wind component: 20 kt headwind
PMC: On
Runway slope: 1.0° uphill
Find the speeds V1, VR and V2:

A) 142.5 kts, 142.5 kts, 148 kts
B) 145 kts, 143.5 kts, 149.5 kts
C) 136 kts, 139 kts, 146 kts
D) 139 kts, 142 kts, 148 kts

Which statement is correct?

A) The climb limited take-off mass increases when a larger take-off flap setting is used
B) The climb limited take-off mass depends on pressure altitude and outer air temperature
C) The climb limited take-off mass will increase if the headwind component increases
D) The performance limited take-off mass is the highest of: - field length limited take-off mass - climb limited take-off mass - obstacle limited take-off mass

Reduced take-off thrust should normally not be used when:

A) obstacles are present close to the end of the runway
B) the runway is wet
C) the runway is contaminated
D) it is dark

During take off, the time between critical engine failure and V1 (recognition time) is assumed to be approximately:

A) 5 seconds
B) 0 seconds
C) 6 seconds
D) 2 seconds

The take-off performance requirements for transport category aeroplanes are based upon:

A) failure of critical engine
B) all engines operating
C) failure of critical engine or all engines operating which ever gives the largest take off distance
D) only one engine operating

The effects of a contaminated runway on the field limit mass are:

A) decreased weight, decreased V1, decreased VR
B) decreased weight, same V1, increased VR
C) decreased weight, increased V1, increased VR
D) decreased weight, same V1, same VR

During take-off, in the event of an engine failure before V1 then take-off:

A) Must be continued
B) Must be rejected
C) Should be rejected
D) Should normally be continued

Which of the following are to be taken into account for the runway in use for take-off?

A) Airport elevation, runway slope, standard temperature, pressure altitude and wind components
B) Airport elevation, runway slope, outside air temperature, pressure altitude and wind components
C) Airport elevation, runway slope, outside air temperature, standard pressure and wind components
D) Airport elevation, runway slope, standard temperature, standard pressure and wind components

During the certification flight testing of a twin engine turbojet aeroplane the real take-off distances are equal to:
1547 m with all engines running
1720 m with failure of critical engine at V1, with all other things remaining unchanged.

The take-off distance adopted for the certification file is:
A) 1779 m
B) 1978 m
C) 1547 m
D) 1720 m

Concerning the landing gear, which of the following factors would limit the take-off mass?
A) Rate of rotation of the wheel at lift off and brake energy
B) Rate of rotation of the wheel and tyre pressure
C) Tyre pressure and brake temperature
D) Nitrogen pressure in the strut, and brake temperature

The 'maximum tyre speed' limits:
A) VLOF in terms of ground speed
B) V1 in kt ground speed
C) V1 in kt TAS
D) VR, or VMU if this is lower than VR

The purpose of the MAT limited TOM is to ensure that in the event of the critical engine failing:
A) The aircraft can comply with the most severe gradient requirement of the Net Take-off Flight Path
B) TODR will not exceed TODA
C) All obstacles will be cleared by the statutory minimum
D) The aircraft can comply with all take-off requirements

Accelerated stop distance:

Fill in the blanks in the following statement which relates to field length limit requirements. " The distance to accelerate to... at which point an engine fails, followed by a reaction time of... and the ensuing deceleration to full stop must be completed within the..."

A) V1; 2 seconds; ASDA
B) V1; 4 seconds; TODA
C) VEF; 4 seconds; ASDA
D) VEF; 2 seconds; TODA

If the antiskid system is inoperative, which of the following statements is true?

A) It has no effect on the accelerate stop distance
B) Take-off with antiskid inoperative is not permitted
C) The accelerate stop distance increases
D) The accelerate stop distance decreases

The balanced field length for an aircraft is when, in the event of an engine failure during take-off:

A) the take-off run required is equal to the accelerate-stop-distance required
B) the distance to accelerate is equal to the distance to stop
C) the take-off distance required is equal to the accelerate-stop-distance required
D) the take-off distance required is equal to the take-off run required

Which of the following distances will increase if you increase V1?

A) Take-off distance
B) Accelerate Stop Distance
C) Take-off run
D) All Engine Take-off distance

A 1% upslope will cause the value of V1 to:

A) Decrease
B) Remain unchanged
C) Increase
D) Equal to VR

Which statement concerning the inclusion of a clearway in take-off calculation is correct?

A) V1 remains constant
B) The usable length of the clearway is not limited
C) The field length limited take-off mass will increase
D) V1 is increased

If a jet engine fails during take off, before V1:

A) the take off should be continued
B) the take off should be aborted
C) the take off can be continued or aborted
D) the take off may be continued if aircraft speed is, above VMCG and lies between VGO and VSTOP

Maximum abandonment speed is the maximum speed from which the aircraft can:

A) Safely abandon take-off in the event of an engine failure
B) Safely abandon take-off with all engines operating
C) Safely abandon the take-off in the event of an engine failure or with all engines operating
D) Safely continue or abandon take-off in the event of an engine failure

When calculating the accelerate-stop distance required, braking is assumed to begin:

A) at the speed V1
B) at the speed reached 2 seconds ater the engine failure has occurred
C) at the speed reached 2 seconds after V1 with all engines operating, or with one engine inoperative, whichever is limiting
D) at the speed at which the engine fails

Up to which height in NADP 1 noise abatement procedure must V2 + 10-20 Kts be maintained?

A) 500 ft
B) 1000 ft
C) 3000 ft
D) 1500 ft

In the event of engine failure below V1, the first action to be taken by the pilot in order to decelerate the aeroplane is to:

A) deploy airbrakes or spoilers
B) reduce the engine thrust
C) reverse engine thrust
D) apply wheel brakes

Complete the following statement regarding the take-off performance of an aeroplane in performance class A:

Following an engine failure at (i) .... and allowing for a reaction time of (ii) .... a correctly loaded aircraft must be capable of decelerating to a halt within the (iii) .... .

A) (i) V1 (ii) 2 seconds (iii) Take-off distance available
B) (i) V1 (ii) 2 seconds (iii) Accelerate - stop distance available
C) (i) V2 (ii) 3 seconds (iii) Take-off distance available
D) (i) V1 (ii) 1 second (iii) Accelerate - stop distance available

With respect to field length limit fill in the blanks in the follow statement:

'The distance to accelerate to... at which point an engine fails, followed by the reaction time of... and the ensuring deceleration to full stop must be complete with the...'

A) V1, 2sec, ASDA
B) VGO, 2sec, ASDA
C) VR, 2sec, TORA
D) VEF, 2sec, TORA

Initial Climb:

The requirement with regards to obstacles in is that the net take-off flight path should clear all obstacles by

A) minimum 50 feet vertically
B) minimum 15 meters vertically
C) minimum 35 feet vertically
D) minimum 100 feet vertically

The requirements with regard to take-off flight path and the climb segments are only specified for:

A) the failure of any engine on a multi-engine aeroplane
B) 2 engine aeroplane
C) the failure of the critical engine on a multi-engines aeroplane
D) the failure of two engines on a multi-engine aeroplane

The minimum climb gradient is 2.6%. At 11,000 kg the climb gradient is 2.8%. How much weight can be added and still achieve the minimum climb gradient?

A) 1846 kg
B) 846 kg
C) 786 kg
D) 1214 kg

V2 is defined as:

A) the all-engines-operating free air safety speed attained at screen height
B) the climb speed necessary to obtain the highest rate of climb
C) the referenced airspeed obtained after lift-off at which the required one-engine-inoperative climb performance can be achieved
D) the climb speed necessary to obtain the highest gradient of climb

Which of the following statements is true regarding the increased V2 procedure?

A) The TOM can always be increased by increasing the V2
B) The take off mass can only be increased by increasing the V2 speed if the field length mass limit is less than the climb limit
C) The take off mass can always be increased by increasing the V2 speed
D) Increasing the V2 speed has the effect of increasing the TODR and increasing the climb gradient for a given TOM

If there is a tail wind, the climb limited TOM will:

A) increase in the flaps extended case
B) increase
C) not be affected
D) decrease

For a class A aircraft, the climb is subdivided into various segments. Which of the following statements is correct?

A) The fourth segment starts at the end of the third segment with the aircraft in a clean configuration with max. continuous power set, ending at 1500ft or higher if there are distant obstacles to clear
B) The first segment starts at the end of the TODA where the aircraft should be at 50ft and the airspeed should be equal to V2
C) The 3rd segment is flown at full take-off thrust with the flaps in take-off position
D) The second segment is flown at V3 up to a height of 400ft (flap retraction height)

For a Class A aircraft the net take-off flight path is subdivided into various segments. Which of the following statements is correct?

A) The 3rd segment is completed at the normal flap retraction height and is flown at max continuous thrust
B) The final segment starts at the end of segment 3 with the aircraft in a clean configuration, at the final segment climb speed with maximum continuous power set, ending at 1500ft or higher if there are distant obstacles to clear
C) The second segment is flown at V3 up to a height of 400ft (Flap retraction height)
D) The first segment starts at the end of TODA where the aircraft should be at 50ft and V2. This segment is flown at V2 whilst the landing gear is retracted

Requirements for the third segment of climb are:

A) there is no climb gradient requirement during acceleration phase
B) level acceleration with an equivalent gradient of 1.2%
C) legal minimum altitude for acceleration is 1500'
D) minimum acceleration altitude for one engine inoperative should be used

The Net Take-off Flight Path terminates when the aeroplane attains a height above reference zero of:

A) 1500 ft net
B) 1200 ft net
C) 1500 ft gross
D) 1200 ft gross

The first segment of the take-off flight path ends:

A) at completion of gear retraction
B) at reaching V2
C) at 35 ft above the runway
D) at completion of flap retraction

In the second segment during take off, flap and gear are:

A) Flap up/gear down
B) Flap up/retracted
C) Flap2/retracting
D) TKOF position/ retracted

When V1 has to be reduced because of a wet runway the one engine out obstacle clearance / climb performance:

A) increases / increases
B) remains constant / remains constant
C) decreases / decreases
D) decreases / remains constant

The climb gradient correction necessary for a turn using 20° of bank is:

A) None
B) The same as a 15° banked turn
C) Twice that of a 15° banked turn
D) Three times that of a 15° banked turn

What is the minimum height to fly level at the beginning of the third segment?

A) 1500 ft
B) On reaching flap retraction speed
C) After gear up
D) 400 ft

Which of the following statements is applicable to the acceleration height at the beginning of the 3rd climb segment?

A) The minimum one engine out acceleration height must be maintained in case of all engines operating
B) The minimum legally allowed acceleration height is at 1500 ft
C) The maximum acceleration height depends on the maximum time take-off thrust may be applied
D) There is no requirement for minimum climb performance when flying at the acceleration height

Take-off with increased V2 speed may be used when:

A) the maximum take-off mass is field length limited
B) the actual take-off weight exceeds the maximum structural take-off weight
C) the maximum take-off mass is tyre speed limited
D) the maximum take-off mass is limited by the climb requirement

Stabilising altitude is:

A) 2000 ft above all obstacles in the en-route domain
B) The pressure altitude at which a 0% gradient is obtained with all engines operating
C) The pressure altitude at which a 0% gradient is obtained in the configuration being considered
D) 1500 ft above the landing aerodrome surface level

The net flight path climb gradient after take-off compared to the gross climb gradient is:
A) depends on type of aircraft
B) equal
C) smaller
D) larger

An aircraft take off weight is climb limited. If there is a significant headwind the take off weight would:
A) Decrease
B) Not change
C) Increase
D) Depend on height of obstacles in the obstacle domain

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21. After takeoff, which airspeed should be flown in order to gain the highest altitude in a given period of time?
A) Vy
B) Vc
C) Va
D) Vx

The net take-off flight path gradient for a 2 engine aircraft is the gross gradient reduced by:
A) 0.8 percent
B) 1.43 percent
C) 0.9 percent
D) 0.7 percent

If an aircraft is to make a 25° banked turn during the climb out the speed required by JAR-OPS is:
A) V2
B) V2 + 5 kts
C) V2 + 15 kts
D) V2 + 10 kts

For a turbojet aeroplane the third segment of climb begins when:
A) landing gear is fully retracted
B) acceleration to flap retraction speed begins (min 400ft)
C) acceleration from VLOF to V2 begins
D) flaps are fully retracted

In relation to the net take-off flight path, the required 35 ft vertical distance to clear all obstacles is
A) the height at which power is reduced to maximum climb thrust
B) based on pressure altitudes
C) the minimum vertical distance between the lowest part of the aeroplane and all obstacles within the obstacle corridor
D) the height by which acceleration and flap retraction should be completed

Which of the following statements, concerning the obstacle limited take-off mass for performance class A aeroplane, is correct?

A) It should not be corrected for 30° bank turns in the take-off path
B) It should be calculated in such a way that there is a margin of 50 ft with respect to the " net take off flight path"
C) it cannot be lower than the corresponding climb limited take-off mass
D) It should be determined on the basis of a 35 ft obstacle clearance with respect to the " net take-off flight path"

The effect of increasing the V2 speed for a given take off mass and aerodrome conditions is:

A) the climb gradient increases and the take off distance increases
B) the climb gradient decreases and the take off distance decreases
C) the climb gradient decreases and the take off distance increases
D) the climb gradient increases and the take off distance decreases

In a turbojet aircraft, if an engine fails in the second segment of the climb at a speed of V2 + 10kts the correct action would be to:

A) level off immediately and commence flap retraction
B) increase speed to V2 + 20kt
C) reduce speed to V2
D) maintain V2 + 10kt

Which of the following sets of factors will increase the climb-limited TOM?

A) High flap setting, low PA, low OAT
B) Low flap setting, low PA, low OAT
C) Low flap setting, high PA, high OAT
D) Low flap setting, high PA, low OAT

In the event that the take-off mass is obstacle limited and the take-off flight path includes a turn, the bank angle should not exceed:

A) 20 degrees up to a height of 400 ft
B) 25 degrees up to a height of 400 ft
C) 10 degrees up to a height of 400 ft
D) 15 degrees up to height of 400 ft

For a turbojet aeroplane the second segment of the climb begins when:

A) Accelerating from V2 to flap retraction speed begins
B) Flaps are fully retracted
C) Flap retraction begins
D) Landing gear is fully retracted

An operator shall ensure that the net take-off flight path clears all obstacles. The half-width of the obstacle- corridor at the distance D from the end of the TODA is at least:

A) 90 m + D/0.125
B) 90 m + 1.125 D
C) 90 m + 0.125 D
D) 0.125 D

The minimum height of flap retraction for a Class A aeroplane is:

A) 200 ft
B) 400 ft
C) 800 ft
D) 50 ft

Which T/O condition is most likely resulting in the poorest climb performance?

A) Sea level field, ISA -10o, T/O flaps 10°
B) 5000' field elevation, ISA -5o. T/O flaps 10°
C) Sea level field, ISA + 5o, T/O flaps 10°
D) 5000' field elevation, ISA + 20o, T/O flaps 30°

For take-off obstacle clearance calculations, obstacles in the first segment may be avoided:

A) only by using standard turns
B) by banking as much as needed if aeroplane is more than 50 ft above runway elevation
C) by standard turns - but only after passing 1500 ft
D) by banking not more than 15° between 50 ft and 400 ft above the runway elevation

The second segment begins:

A) when landing gear is fully retracted
B) when flaps are selected up
C) when acceleration starts from V2 to the speed for flap retraction
D) when flap retraction begins

Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?

A) Low temperature, low relative humidity, and low density altitude
B) High temperature, low relative humidity, and low density altitude
C) High temperature, high relative humidity, and high density altitude
D) Low temperature, high relative humidity and low density altitude

Which of the following set of factors could lead to a V2 value which is limited by VMCA?

A) High take-off mass, low flap setting and high field elevation
B) High take-off mass, high flap setting and low field elevation
C) Low take-off mass, low flap setting and low field elevation
D) Low take-off mass, high flap setting and low field elevation

Given that the characteristics of a three engine turbojet aeroplane are as follows:

Thrust = 50 000 Newton / Engine g = 10 m/s2
Drag = 72 569 N
Minimum gross gradient (2nd segment) = 2.7%
SIN (Angle of climb) = (Thrust - Drag) / Weight

The maximum take-off mass under 2nd segment conditions is:

A) 101 596 Kg
B) 74 064 Kg
C) 286 781 Kg
D) 209 064 Kg

For a jet aircraft the climb is subdivided into various segments. Which of the following statements is correct?

A) The final segment starts at the end of segment 3 with the aircraft in a clean configuration, at the climb speed with maximum continuous power set, ending at 1500 ft or higher if there are distant obstacles to clear.
B) The first segment starts at the end of TODA where the aircraft should be at 50 ft and V2. This segment is flown at V2 whilst the landing gear is retracted.
C) The second segment is flown at V3 up to a height of 400 ft (The Maximum flap retraction height).
D) The 3rd segment completed at the normal flap retraction height and is flown at Take-Off thrust until the flaps are retracted.

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41. The take-off safety speed V2 for two-engine or three-engine turbo propeller powered aeroplanes may not be less than:

A) 1.15 Vs1
B) 1.2 Vs
C) 1.3 Vs
D) 1.15 Vs

How does the maximum climb limited take-off mass change under tailwind conditions?

A) Increases with flaps extended for take-off
B) Does not change
C) Increases
D) Decreases

The minimum value of V2 (V2min) :

A) must not be less than 1.1 VSR or 1.2 VMC
B) must not be less than 1.1 VLOF or 1.13 VSR
C) must not be less than 1.1 Vmc or 1.13 VSR
D) must not be less than 1.1 VMU or 1.13 VSR

If the flap selection is changed from 5º to 15º then V2 will:

A) decrease
B) stay the same
C) none of the above
D) increase

At which minimum height will the second climb segment end?

A) 35 ft above ground
B) 400 ft above field elevation
C) 1500 ft above field elevation
D) When gear retraction is completed

If a turn is commenced during the take off flight path, the load factor (i), the induced drag (ii), and the climb gradient (iii), will :

A) (i) increase, (ii) decrease, (iii) decrease
B) (i) decrease, (ii) increase, (iii) increase
C) (i) increase, (ii) increase, (iii) decrease
D) (i) decrease, (ii) decrease, (iii) increase

V2 MIN is determined by: (excluding Vmca)

A) 1.15Vs for all aeroplanes
B) 1.2VSR for all turboprops and 1.15VSR for all turbojets
C) 1.08VSR for 4 engine turboprops with 1.13VSR for 2 and 3 engine turboprops
D) 1.2VS for all turbojets

Runway 09/27 has a length of 2000 m, the elevation of the 09 threshold is 250 ft and the elevation of 27 threshold is 240 ft. The elevation of the obstacle is 360 ft. The height of the obstacle which should be assumed to determine the maximum mass for take off is:

A) 110 ft
B) 370 ft
C) 360 ft
D) 120 ft

Required net climb gradients in the 1st segment for 3-engine aircraft with one engine out are:

A) 0,3%
B) 2,7%
C) 5,5%
D) 0,1 %

An obstacle is positioned at 2400m from the end of TODA and is offset 400m from the centre-line. For an aeroplane making a 10° turn after the end of TODA and unable to maintain the required navigational accuracy this obstacle is considered to be:

A) 90m inside the obstacle accountability area
B) 10m outside the obstacle accountability area
C) 10m inside the obstacle accountability area
D) 90m outside the obstacle accountability area

The minimum climb gradient required on the 2nd flight path segment after the take-off of a jet aeroplane is defined by the following parameters:

1. Gear up
2. Gear down
3. Wing flaps retracted
4. Wing flaps in take-off position
5. N engines at the take-off thrust
6. N-1) engines at the take-off thrust
7. Speed over the path equal to V2 + 10 kt
8. Speed over the path equal to 1.3 VS
9. Speed over the path equal to V2 -
10. At a height of 35 ft above the runway

The correct statements are:

A) 2, 3, 6, 9
B) 1, 5, 8, 10
C) 1, 4, 6, 9
D) 1, 4, 5, 10

Which of the following statements is correct?

A) The performance limited take-off mass is independent of the wind component
B) The take-off distance with one engine out is independent of the wind component
C) The climb limited take-off mass is independent of the wind component
D) The accelerate stop distance required is independent of the runway condition

Given:
BRP: 3420 ft AMSL
Runway slope: 1.3% downhill
TODR: 2760 m
Obstacle elevation: 3785 ft

Calculate the obstacle height above reference zero for the MRJT:

A) 482.7ft
B) 365 ft
C) 1025 ft
D) 247.3 ft

For the third segment of the take off flight path, which of the following combinations of speed, power, flap setting, and landing gear position is correct?

(Speed / Power / Flap / Gear)

A) V2 / Take off / Take off / Retracted
B) V 2 / Max. Continuous / Being retracted / Retracted
C) Accelerating / Take off / Being retracted / Retracted
D) Accelerating / Take off / Take off / Down

The minimum gross climb gradient in the first take-off segment, for a twin-engine aeroplane is:

A) 2.4 percent
B) 3.2 percent
C) 1.8 percent
D) measurably positive

Vx and Vy with take-off flaps will be:

A) changed so that Vx increases and Vy decreases compared to clean configuration
B) lower than that for clean configuration
C) same as that for clean configuration
D) higher than that for clean configuration

The height below which turns are not permitted after take-off is:

A) 50ft or half wing span whichever is higher
B) 50 ft
C) 35 ft
D) Half wing span

What is the maximum angle of bank planned for in a curved flight path during climb out on aircraft over 5700 kg?

A) 5°
B) 15°
C) 20°
D) 10°

How will frost on the wings of an airplane affect takeoff performance?

A) Frost will change the camber of the wing, increasing its lifting capability
B) Frost has no influence on aeroplane performance
C) Frost will cause the stall speed to decrease
D) Frost will disrupt the smooth flow of air over the wing, adversely affecting its lifting capability

A turbo-prop aircraft with a maximum all up mass in excess of 5700 kg, is limited to:

A) 15° angle of bank up to 400 ft
B) 10° angle of bank up to 400 ft
C) 25° angle of bank up to 400 ft
D) 20° angle of bank up to 400 ft

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61. The reduction to be applied to the gross gradient to obtain the net gradient for a twin-engine aeroplane is:

A) 0.7 percent
B) 1.4 percent
C) 2.4 percent
D) 0.8 percent

The minimum time from VLOF to the initiation of undercarriage retraction is:

A) 3 seconds
B) 1 seconds
C) 4 seconds
D) 2 seconds

The second segment gradient requirement for a two engine aircraft is 2.4%. If the total drag of the aircraft at V2 is 18500 lbs, and the thrust per engine is 22000 lbs, the maximum permissible climb limited take off weight would be :

A) 90 300 lbs
B) 1 062 500 lbs
C) 91 700 lbs
D) 145 800 lbs

Which of the following statements is correct with regard to turns on the take-off flight path?

A) Above 400 ft a turn may not be assumed with a bank angle greater than 15°
B) For an aircraft with a wing span of 120 ft turns may not be assumed to take place below 60 ft
C) During a turn the climb gradient may be assumed to be the same as on the straight flight path
D) Tums may not be assumed to take place below 400 ft

If an aircraft changes course by 10° in the climb and the required navigational accuracy cannot be maintained, the maximum semi-width of the obstacle domain is:

A) 300 m
B) 1200 m
C) 900 m
D) 600 m

The second segment gradient requirement for a two engine aircraft is 2.4%. If the V2 speed is 150 knots IAS the rate of climb at sea level ISA when operating at the W.A.T. limit would be approximately:

A) 625 ft./min
B) 240 ft./min
C) 150 ft./min
D) 360 ft./min

The take-off mass of an aeroplane is restricted by the climb limit. What would be the effect on this limit of an increase in the headwind component?

A) The effect would vary depending upon the height of any obstacle within the net take-off flight path
B) None
C) The climb limited take-off mass would increase
D) The climb limited take-off mass would decrease

A Boeing 747-400 has a wing span of 64.4 m. When considering relevant obstacles for the take-off flight path what is the semi-width of the zone at a distance of 1500 m from the TODA?

A) 198.7m
B) 277.5 m
C) 300 m
D) 279.7m

Which of the following is not affected by a wind component on take-off?

A) Tyre speed limited TOM
B) Obstacle limited TOM
C) Climb limited TOM
D) Field length limited TOM

Which of the following statements with regard to the actual acceleration height at the beginning of the 3rd climb segment is correct?

A) The minimum value according to regulations is 400 ft
B) There is no legal minimum value, because this will be determined from case to case during the calculation of the net flight path
C) The minimum value according to regulations is 1000 ft
D) A lower height than 400 ft is allowed in special circumstances e.g. noise abatement

What factors would cause V2 to be limited by Vmca?

A) With low temperature
B) Combination of the above
C) With high pressure
D) Flaps at high settings

Climb:

If the climb speed schedule is changed from 280/.74 to 290/.74 the new crossover altitude is:
A) higher
B) lower
C) unchanged
D) only affected by the aeroplane gross mass

What is the effect of tail wind on the time to climb to a given altitude?
A) The effect on time to climb will depend on the aeroplane type
B) The time to climb does not change
C) The time to climb decreases
D) The time to climb increases

You climb with a climb speed schedule 300/.78. What do you expect in the crossover altitude 29 200 ft (OAT = ISA)?
A) The rate of climb increases since the constant IAS-climb is replaced by the constant Mach-climb
B) During the acceleration to the Mach number .78 the rate of climb is approximately zero
C) No noticeable effect since the true airspeed at 300 kt IAS and .78 Mach are the same (at ISA temperature TAS=460 kt)
D) The rate of climb decreases since climb performance at a constant Mach number is grossly reduced as compared to constant IAS

The diminishment to be applied to the gross gradient to obtain the net gradient for a twin-engine Class A aeroplane is:
A) 0.7%
B) 0.8%
C) 1.0%
D) 0.9%

A head wind will:
A) increase the rate of climb
B) shorten the time of climb
C) increase the angle of climb
D) increase the climb flight path angle

The amount by which the gross gradient must be diminished to determine the net gradient of climb for a four- engine aeroplane is:
A) 0.8%
B) 1.0%
C) 0.9%
D) 0.7%

At MSL, in ISA conditions, climb gradient = 6 %. What would the climb gradient be if:
Pressure altitude: 1000 ft
Temperature: 17° C
Engine anti-ice: on
Wing anti-ice: on
(- 0.2 % engine anti-ice, - 0.1 % wing anti ice, + - 0.2 % per 1000 ft pressure altitude, + - 0.1 % per 10 ISA deviation)

A) 5.1 %
B) 3.8 %
C) 5.5 %
D) 6.3 %

An increase in ambient temperature causes the absolute ceiling to:

A) remain unchanged
B) decrease
C) increase subject to its relation to ISA
D) increase

When climbing at a constant MNo through the troposphere, TAS:

A) remains constant
B) increases then decreases
C) decreases
D) increases

Which speed provides maximum obstacle clearance during climb?

A) V2
B) V2 + 10 kt
C) The speed for maximum rate of climb
D) The speed for which the ratio between rate of climb and forward speed is maximum

An aircraft is climbing as a constant Mach number in ISA conditions. Above the tropopause :

A) the IAS decreases, the TAS decreases
B) the IAS is constant, the TAS increases
C) the IAS is constant, the TAS is constant
D) the IAS decreases, the TAS is constant

For a given aircraft mass, the climb gradient :

A) increases if the aircraft is accelerating and if the temperature increases
B) decreases if the aircraft is accelerating and if the temperature increases
C) increases if the aircraft is accelerating and if the temperature decreases
D) decreases if the aircraft is accelerating and if the temperature decreases

What happens to the speed for Vx and Vy with increasing altitude?

A) Vx increases and Vy decreases
B) Vx increases and Vy remains constant
C) Vx remains constant and Vy increases
D) Both remain constant

For an aircraft climbing at a constant IAS, the True airspeed (i) and the Mach number (ii) will :

A) (i) increase (ii) decrease
B) (i) decrease (ii) increase
C) (i) increase (ii) increase
D) (i) decrease (ii) decrease

Of the four forces acting on an aircraft what balances thrust in a climb?

A) Drag
B) Weight
C) Drag + W.cos(climb angle)
D) Drag + W.sin(climb angle)

How does an increased altitude affect the indicated stalling speed (when compressibility effects have to be accounted for)?

A) Indicated stalling speed will not change up to 25 000 ft, then decreases at higher altitudes
B) Indicated stalling speed will increase
C) Indicated stalling speed will not change up to 25 000 ft, then increases at higher altitudes
D) Indicated stalling speed will not change

In a climb, at a constant IAS / Mach No. 300 kts / 0.78 M., what happens at the change over point (29 500 ft, ISA)?

A) No change in rate of climb since TAS remains constant
B) Find that rate of climb would start to decrease, because TAS would start to decrease
C) Find that rate of climb would start to increase, because TAS starts to increase
D) Accelerate from the IAS to the Mach number, and therefore rate of climb will decrease

Compared to the gross gradient of climb the net climb gradient will be:

A) less
B) greater
C) either greater or less depending on type
D) the same

Which of the following sequences of speed for a jet aeroplane is correct? (from low to high speeds)

A) Vs, maximum angle climb speed, maximum range speed
B) Vs, maximum range speed, maximum angle climb speed
C) Maximum endurance speed, long range speed, maximum range speed
D) Maximum endurance speed, maximum range speed, maximum angle of climb speed

With a jet aeroplane the maximum climb angle can be flown at approximately:
A) The highest CL/CD^2 ratio
B) The highest CL/CD ratio
C) Vs
D) Vs

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21. During climb, the maximum rate of climb:
A) remains unchanged
B) decreases
C) increases
D) varies randomly

A constant headwind component:
A) increases the maximum endurance
B) increases the angle of flight path during climb
C) increases the best rate of climb
D) decreases the angle of climb

Climbing in a normal atmosphere, at a constant Mach no. the effect of a head wind on the rate of climb will cause it to:
A) Increased rapidly
B) Remain unchanged
C) Increase slowly
D) Decrease slowly

To maintain climb airspeed following an increase in temperature the rate of climb is:
A) zero
B) reduced
C) increased
D) unaffected

When the climb speed plan changes from 280/.74 to 290/.74 the new changeover altitude will be:
A) Unchanged
B) Higher
C) Lower
D) Influenced only by the aeroplane gross mass

A four jet-engine aeroplane (mass = 150 000 kg) is established on climb with all engines operating. The lift-to- drag ratio is 14. Each engine has a thrust of 75 000 Newton' s. The gradient of climb is: (given: g= 10 m/s^2):
A) 7.86%
B) 1.286%
C) 12.86%
D) 27%

Other factors remaining constant, how does increasing altitude affect Vx and Vy:

A) Vx will decrease and Vy will increase
B) Both will remain the same
C) Vx will increase Vy will decrease
D) Both will increase

On a segment of the take-off flight path an obstacle requires a minimum gradient of climb of 2.6% in order to provide an adequate margin of safe clearance. At a mass of 110 000 kg the gradient of climb is 2.8%. For the same power and assuming that the sine of the angle of climb varies inversely with mass, at what maximum mass will the aeroplane be able to achieve the minimum gradient?

A) 106 425 kg
B) 118 455 kg
C) 121 310 kg
D) 102 150 kg

Given a jet aircraft. Which order of increasing speeds in the performance diagram is correct?

A) Vs, Vx, Maximum range speed
B) Maximum endurance speed, Long range speed, Maximum range speed
C) Maximum endurance speed, Maximum range speed, Vx
D) Vs, Maximum range speed, Vx

The best rate of climb at a constant gross mass

A) is independent of altitude
B) decreases with increasing altitude since the thrust available decreases due to the lower air density
C) increases with increasing altitude due to the higher true airspeed
D) increases with increasing altitude since the drag decreases due to the lower air density

For a given aircraft mass as altitude increases the effect on the margins to the low speed and high speed buffet is to:

A) decrease both margins
B) decrease the low speed margin and increase the high speed margin
C) increase the low speed margin but decrease the high speed margin
D) increase both margins

A jet aeroplane is climbing at constant Mach number below the tropopause. Which of the following statements is correct?

A) IAS decreases and TAS decreases
B) IAS decreases and TAS increases
C) IAS increases and TAS decreases
D) IAS increases and TAS increases

An aircraft with a climb gradient of 3.3%, flying at an IAS of 85 KTS. At a pressure ALT of 8500 ft with a temperature of +15° C will have a ROC of:

A) 284'/Min
B) 623'/Min
C) 1117'/Min
D) 334'/Min

The main reason for using the stepped climb technique is to:

A) increase endurance
B) increase range
C) adhere to ATC procedures
D) decrease sector times

An aircraft has a mass of 5700 kg, the drag at best climb speed is 6675 N and the thrust available is 15.6 kN.
The gradient of climb would be:

A) 16 %
B) 1.17 %
C) 1.56 %
D) 8.9 %

Relative to the ground a headwind _____ the effective climb angle and a tailwind _____ the effective climb angle.

A) decreases; increases
B) decreases; decreases
C) increases; decreases
D) increases; increases

Which of the following statements is correct?

A) Reduced thrust may be used for take-off if the runway is contaminated
B) The increased V2 procedure may be used with a reduced thrust take-off
C) The increased V2 procedure would only be used if the climb limited take-off mass is less than the field length limited take-off mass
D) Reduced thrust may be used for take-off if the anti-skid system is inoperative

An aircraft has a climb speed schedule of 250 KIAS / 0.8 M. If the climb TAS is increased to 270 KIAS the Mach limit will be reached :

A) at a lower altitude at all temperatures
B) at a higher altitude for temperatures above ISA
C) at the same altitude at all temperatures
D) at a higher altitude at all temperatures

A jet aeroplane is climbing with constant IAS. Which operational speed limit is most likely to be reached?

A) The Minimum control speed air
B) The Mach limit for the Mach trim system
C) The Maximum operating Mach number
D) The Stalling speed

In a constant Mach number climb, how does True Airspeed vary?

A) Remains constant
B) Decreases
C) Increases
D) Increases then decreases

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41. When climbing at a constant Mach number in the troposphere, what is the effect on (i) IAS and (ii) TAS?

A) h(i) remains constant, (ii) decreases
B) h(i) increases, (ii) decreases
C) h(i) decreases, (ii) increases
D) h(i) decreases, (ii) decreases

The lowest point of the drag or thrust required curve of a jet aeroplane, respectively, is the point for:

A) minimum incidence
B) minimum specific range
C) maximum endurance
D) maximum specific range

Climbing to cruise altitude in a headwind will:

A) increase the time taken
B) decrease the ground distance covered
C) decrease the time taken
D) increase the fuel flow rate

A jet aeroplane is climbing at a constant IAS and maximum climb thrust, how will the climb angle / the pitch angle change?

A) Remain constant / decrease
B) Reduce / decrease
C) Reduce / remain constant
D) Remain constant / become larger

At mean sea level in ISA conditions the aircraft climb gradient is 6%. Use the corrections below to determine the climb gradient for a pressure altitude of 1000 ft and an air temperature of 17º C with engine and wing anti-icing on.
Engine Anti-Ice: - 0.2%
Wing Anti-Ice: - 0.1%
1000 ft pressure Altitude: +/- 0.2%
1º ISA deviation: +/- 0.1%

A) 5.1%
B) 5.5%
C) 6.3%
D) 3.8%

As altitude increases the stalling speed of an aircraft in terms of (i) IAS, (ii) TAS and (iii) Mach number will...

A) remain constant, increase, decrease
B) increase, decrease, decrease
C) increase, decrease, increase
D) remain constant, increase, increase

Which statement with respect to the step climb is correct?

A) A step climb may not be performed unless it is indicated in the filed flight plan
B) Performing a step climb based on economy can be limited by the 1.3-g altitude
C) A step climb provides better economy than a cruise climb
D) In principle a step climb is performed immediately after the aircraft has exceeded the optimum altitude

What happens when an aeroplane climbs at a constant Mach number?

A) IAS stays constant so there will be no problems
B) The TAS continues to increase, which may lead to structural problems
C) The " 1.3G" altitude is exceeded, so Mach buffet will start immediately
D) The lift coefficient increases

How does TAS vary in a constant Mach climb in the troposphere?

A) TAS is constant
B) TAS is not related to Mach Number
C) TAS decreases
D) TAS increases

What happens to the drag of a jet aeroplane if, during the initial climb after take off, constant IAS is maintained?
(Assume a constant mass)

A) The drag increases initially and decreases thereafter
B) The drag increases considerably
C) The drag remains almost constant
D) The drag decreases

Cruise:

The drift down procedure is used:
A) after a decompression at height
B) for a visual approach using VASIs or PAPIs
C) for an instrument approach at an alternate
D) when an engine fails above the one engine inoperative stabilising height

Vmca is defined as the minimum speed at which directional control can be maintained in flight with an engine failure in a defined configuration which include:
A) flaps in landing position
B) zero yaw
C) 0° bank
D) Landing gear down

How does the long range cruise speed change?
A) LRC Mach number decreases with increasing altitude
B) LRC Mach number decreases with decreasing altitude
C) LRC Indicated airspeed increases with increasing altitude
D) LRC True airspeed decreases with increasing altitude

All other factors being equal minimum drag speed is...
A) proportional to temperature
B) a function of density altitude
C) proportional to weight
D) a function of pressure altitude

Long range cruise is a flight procedure which gives:
A) a specific range which is 99% of maximum specific range and a lower cruise speed
B) a specific range which is about 99% of maximum specific range and higher cruise speed
C) an IAS which is 1% higher than the IAS for maximum specific range
D) a 1% higher TAS for maximum specific range

If the angle of attack is increased from 4 degrees to 8 degrees:
A) the stalling angle of the wing will be reduced
B) the lift-to-drag ratio will increase
C) the lift-to-drag ratio will reduce
D) the lift-to-drag ratio will remain the same

The tangent from the origin to the power required curve for a jet aircraft gives:
A) the max range speed
B) the minimum power speed
C) VMD
D) the long range cruise speed

What is a COST INDEX?

A) A number denoting the cost per nautical mile
B) A number denoting the ratio of the cost of fuel to speed
C) A number denoting the ratio of direct operating costs to speed
D) A number denoting the ratio of the costs of crew and maintenance to the cost of fuel

Under which condition should you fly considerably lower (4000 ft or more) than the optimum altitude?

A) If at the lower altitude either considerably less headwind or considerably more tailwind can be expected
B) If the temperature is lower at the low altitude (high altitude inversion)
C) If at the lower altitude either more headwind or less tailwind can be expected
D) If the maximum altitude is below the optimum altitude

For a jet aeroplane consumption is directly proportional to:

A) Power and RPM
B) Thrust and IAS
C) Power and IAS
D) Weight and RPM

Endurance for a jet aircraft is a maximum:

A) at low altitude, and decreases with increasing aircraft mass
B) at low altitude, and increases with increasing aircraft mass
C) at high altitude, and increases with increasing aircraft mass
D) at high altitude, and decreases with increasing aircraft mass

Which of the following variables will not affect the shape or position of the drag-IAS curve, for speeds below Mcrit:

A) configuration
B) weight
C) aspect ratio
D) altitude

Referring to the diagram 4-24 in CAP 698, why does the curve for an equivalent weight of 35,000 kg, only start 4 mins after engine failure?

A) At that weight the aircraft takes longer to slowdown to the optimum drift down speed
B) At that altitude the engine takes longer to spool down after failure
C) At that weight the aircraft has a higher TAS and therefore more momentum
D) All the curves start at the same point higher up

For a jet engine aeroplane, the long range cruise speed is:

A) greater than maximum range speed
B) equal to the maximum endurance speed
C) less than maximum range speed
D) equal to the maximum range speed

Maximum endurance:

A) is the same as maximum specific range with wind correction
B) is achieved in un-accelerated level flight with minimum fuel consumption
C) can be flown in a steady climb only
D) can be reached with the 'best rate of climb' speed in level flight

What is the effect of the centre of gravity on fuel consumption?

A) The centre of gravity has no effect on fuel consumption
B) The further aft the centre of gravity the greater the fuel consumption compared to an aircraft with a forward centre of gravity
C) The further the distance of the centre of gravity from the centre of pressure the greater the fuel consumption
D) The further forward the centre of gravity the greater the fuel consumption compared to an aircraft with an aft centre of gravity

For a given flight level the speed range determined by the buffet onset boundary will decrease with:

A) reduced weight
B) reduced bank angle
C) with increased temperature
D) with a more forward centre of gravity

Long range cruise is selected as:

A) specific range with tailwind.
B) the climbing cruise with one or two engines inoperative.
C) the speed for best economy.
D) the higher speed to achieve 99% of maximum specific range in zero wind.

Which one of the following statements concerning drift-down is correct?

A) The drift-down procedure requires a minimum obstacle clearance of 35 ft
B) The drift-down procedure requires a minimum descent angle after an engine failure at cruising altitude
C) When determining the obstacle clearance during drift-down, fuel dumping may be taken into account
D) An engine failure at high cruising altitude will always result in a drift-down, because it is not permitted to fly the same altitude with one engine inoperative as with all engines operating

Equivalent airspeed is equal to:

A) the calibrated airspeed corrected for density error
B) the calibrated airspeed corrected for instrument error
C) the calibrated airspeed corrected for residual compressibility effects
D) the indicated airspeed corrected for instrument and density error

21. The service ceiling of an aircraft is defined as:

A) the altitude where the basic stalling speed is equal to the critical Mach number
B) the altitude above which cruising speed cannot be maintained
C) the altitude where a specified rate of climb (e.g. 100ft/min) is still achievable
D) the altitude where rate of climb becomes zero

The pilots of a jet aircraft wish to reach the destination with minimum use of fuel. They should fly at:

A) Best L/D Speed
B) Max Range Cruise Speed
C) Long Range Cruise Speed
D) Minimum Power Speed

At speeds below minimum drag:

A) a lower speed requires a higher thrust
B) the aeroplane can not be controlled manually
C) a higher speed requires a higher thrust
D) the aeroplane can be controlled only in level flight

If the thrust available exceeds the thrust required for level flight:

A) the aeroplane decelerates if the altitude is maintained
B) the aeroplane decelerates if it is in the region of reversed command
C) the aeroplane accelerates if the altitude is maintained
D) the aeroplane descends if the airspeed is maintained

Which of the jet engine ratings below is not a certified rating?

A) Maximum Take-off Thrust
B) Maximum Cruise Thrust
C) Go-Around Thrust
D) Maximum Continuous Thrust

Which of the equations below defines specific range (SR)?

A) SR = Mach Number/Total Fuel Flow
B) SR = Groundspeed/Total Fuel Flow
C) SR = True Airspeed/Total Fuel Flow
D) SR = Indicated Airspeed/Total Fuel Flow

A common unit for Thrust Specific Fuel Consumption (TSFC):

A) lb / hr
B) hr x lb / lb
C) lb / lb / hr
D) hr / lb

A twin jet aeroplane is in cruise, with one engine inoperative, and has to overfly a high terrain area. In order to allow the greatest clearance height, the appropriate airspeed must be the airspeed

A) for long-range cruise
B) giving the lowest Cl/Cd ratio
C) giving the highest Cd/Cl ratio
D) of greatest lift-to-drag ratio

For a jet engine powered airplane which of the following corresponds to the speed for best L/D?

A) VNO
B) VLO
C) Speed for best range
D) Speed for best endurance

For a given aircraft mass, flying with a cost index greater that zero set will result in:

A) climb at the slowest safe speed, taking into account stall and speed stability
B) a cruise at a faster MNo than the MNo giving best ANM/kg ratio for a given altitude
C) a cruise at the maximum endurance speed
D) a cruise at a slower MNo than the best range MNo for a given altitude

Below the optimum cruise altitude:

A) the TAS for long range cruise increases continuously with decreasing altitude
B) the Mach number for long range cruise decreases continuously with decreasing altitude
C) the Mach number for long range cruise increases continuously with decreasing altitude
D) the IAS for long range cruise increases continuously with decreasing altitude

Buffet may occur :

A) only at very high or very low speed
B) at any speed depending on the combination of angle of attack and Mach number
C) only at very high speed
D) only at very low speed

If the aircraft mass is increased by 10% at a constant IAS below Mcrit :

A) Vmd will increase by 5% and parasite drag will increase by 10%
B) Vmd will increase by 5 % and parasite drag will be constant
C) Vmd will increase by 10% and parasite drag will increase by 5%
D) Vmd will be constant and parasite drag will increase by 10%

The danger associated with low speed and/or high speed buffet:

A) exists only above MMO
B) has to be considered at take-off and landing
C) limits the manoeuvring load factor at high altitudes
D) can be reduced by increasing the load factor

The centre of gravity near, but still within, the aft limit:

A) improves the longitudinal stability.
B) increases the stalling speed
C) decreases the maximum range
D) improves the maximum range

The maximum speed that can be achieved in level flight will occur :

A) when CL : CD is a maximum
B) when CD is a minimum
C) when the drag is equal to the maximum thrust available
D) when the drag is a minimum

If there is a tailwind:

A) the minimum drag speed is decreases
B) the change in minimum drag speed is equal to the tailwind component
C) the minimum drag speed increases
D) the minimum drag speed is not affected

The maximum endurance for a jet aircraft is obtained at:

A) VIMD at the highest practicable altitude
B) VI/MAX at the highest practicable altitude
C) VIMP at the lowest practicable altitude
D) VIMD at the lowest practicable altitude

Why are STEP CLIMBS used on long distance flights?

A) Step climbs are only justified if at the higher altitude less headwind or more tailwind can be expected
B) Step climbs do not have any special purpose for jet aeroplanes; they are used for piston engine aeroplanes only
C) To respect ATC flight level constraints
D) To fly as close as possible to the optimum altitude as aeroplane mass reduces

With all other things remaining unchanged and with T the outside static air temperature expressed in degrees K, the hourly fuel consumption of a turbojet powered aeroplane in a cruise flight with a constant Mach Number and zero headwind, is as follows:

A) proportional to T
B) proportional to 1/T
C) proportional to $1/T^2$
D) independent from T

41. The speed for maximum endurance:

A) is the lower speed to achieve 99% of maximum specific range
B) can either be lower or higher than the speed for maximum specific range
C) is always lower than the speed for maximum specific range
D) is always higher than the speed for maximum specific range

As you accelerate in level flight from the speed at CLMax to maximum speed the total drag:

A) decreases then increases.
B) decreases.
C) increases.
D) increases then decreases.

The Specific Fuel Consumption (SFC) for a jet engine is:

A) the thrust produced per kilogram of fuel used
B) the miles flown per kilogram fuel used
C) the fuel flow per unit of thrust
D) the fuel flow at maximum take-off thrust

During a driftdown following engine failure, what would be the correct procedure to follow?

A) Begin fuel jettison immediately, commensurate with having required reserves at destination
B) Do not commence fuel jettison until enroute obstacles have been cleared
C) Disregard the flight manual and descend at Vs +10kts to the destination
D) Descend in the approach configuration

For an aircraft in a level flight cruise at Vmd, if the mass is decreased :

A) the minimum drag decreases and IAS increases
B) the minimum drag remains the same and IAS decreases
C) the minimum drag decreases and US decreases
D) the minimum drag remains the same and IAS remains the same

An aeroplane operating under the 180 minutes ETOPS rule may be up to:

A) 180 minutes flying time to a suitable airport under the prevailing weather condition with one engine inoperative
B) 180 minutes flying time to a suitable airport in still air with one engine inoperative
C) 90 minutes flying time from the first enroute airport and another 90 minutes from the second enroute airport in still air with one engine inoperative
D) 180 minutes flying time from suitable airport in still air at a normal cruising speed

What is the relationship between total drag (TD) and airspeed (V) at speeds greater than VMD?

A) TD = f(V4)
B) TD = f(V2)
C) TD = f(1/V)
D) TD = f(1/V2)

The speed range between low speed buffet and high speed buffet

A) increases with increasing mass
B) narrows with increasing mass and increasing altitude
C) decreases with increasing mass and is independent of altitude
D) is only limiting at low altitudes

At a given altitude, when a turbojet aeroplane mass is increased by 5%, assuming the engines specific consumption remains unchanged, its hourly consumption is approximately increased by:

A) 5 %
B) 7.5 %
C) 10 %
D) 2.5 %

The minimum drag speed is a function of:

A) thrust and lift
B) weight, wing surface and aeroplane configuration
C) weight, speed and lift
D) ambient pressure and temperature

The speed for long range cruise is:

A) less than or equal to endurance speed
B) less than maximum range speed
C) greater than maximum range speed
D) equal to maximum range speed

For a non-ETOPs approved twin engine aircraft:

A) it must not be more than 90 minutes in still air, JSA, from a suitable aerodrome
B) it must not be more than 60 minutes in still air, ISA, from a suitable aerodrome
C) it must not be more than 60 nm. from a suitable aerodrome
D) it must not be more than 60 minutes in the forecast wind, ISA. from a suitable aerodrome

For a jet aircraft the maximum achievable True Air Speed will occur:

A) at the same altitude that the maximum Indicated Air Speed occurs
B) at high altitude but below the absolute ceiling
C) at sea level
D) at the absolute ceiling

Considering max range vs headwind:

A) only piston engine aircraft are affected
B) higher speed for obtaining max range
C) wind have no effect on max range
D) lower speed for obtaining max range

In the drag versus TAS curve for a jet aeroplane, the speed for maximum range corresponds with:

A) the point of contact of the tangent from the origin to the parasite drag curve
B) the point of intersection of the parasite drag curve and the induced drag curve
C) the point of contact of the tangent from the origin to the induced drag curve
D) the point of contact of the tangent from the origin to the drag curve

ETOPS flight is a twin engine jet aeroplane flight conducted over a route, where no suitable airport is within an area of:

A) 30 minutes flying time at the normal cruising speed
B) 75 minutes flying time at the approved one engine out cruise speed
C) 60 minutes flying time in still air at the approved one engine out cruise speed
D) 60 minutes flying time in still air at the normal cruising speed

The long range cruise speed is in relation to the speed for maximum range cruise.

A) Depending on density altitude and mass
B) Depending on the OAT and net mass
C) Higher
D) Lower

The drift down procedure is applied...

A) after an engine failure above the one-engine inoperative stabilising height
B) during a visual approach
C) during an instrument approach at an airfield with no ILS
D) following a pressurisation failure

Which of the following is a reason to operate an aeroplane at 'long range speed'?

A) In order to achieve speed stability
B) The aircraft can be operated close to the buffet onset speed
C) In order to prevent loss of speed stability and tuck-under
D) It is efficient to fly slightly faster than with maximum range speed

For an aircraft cruising at a constant altitude and a constant angle of attack, as weight decreases :

A) the IAS will remain constant, and the thrust required will decrease
B) the IAS will remain constant , and the thrust required will remain the same
C) the IAS will decrease, and the thrust required will decrease
D) the IAS will decrease, and the thrust required will remain the same

61. Which of the following statements is correct with regard to the en-route regulations for twin engine aircraft after engine:

A) If the flight is continued to a landing aerodrome, obstacles must be cleared by 1000 ft
B) the effect of fuel jettisoning on the aircraft weight is not permitted
C) the aircraft must have a positive climb gradient at 1500 ft. above the landing aerodrome
D) the gross gradient must be reduced by 0.9%

During cruise phase the net flight-profile of a 3-engine jet aeroplane with one engine inoperative must have a zero or positive climb gradient at a height of.... above an obstacle.

A) 1 500 ft
B) 500 ft
C) 1 000 ft
D) 2 000 ft

Region of REVERSED COMMAND means:

A) a lower airspeed requires more thrust
B) a thrust reduction results in an acceleration of the aeroplane
C) the thrust required is independent of the airspeed
D) a momentary increase of airspeed has no influence on the thrust required

The optimum cruise altitude increases:

A) if the aeroplane mass is decreased
B) if the aeroplane mass is increased
C) if the tailwind component is decreased
D) if the temperature (OAT) is increased

The aerodynamic ceiling:

A) depends upon thrust setting and increase with increasing thrust
B) is the altitude at which the best rate of climb theoretically is zero
C) is the altitude at which the speeds for low speed buffet and for high speed buffet are the same
D) is the altitude at which the aeroplane reaches 50 ft/min

On a long distance flight the gross mass decreases continuously as a consequence of the fuel consumption.
The result is:

A) The speed must be increased to compensate the lower mass
B) The specific range increases and the optimum altitude decreases
C) The specific range decreases and the optimum altitude increases
D) The specific range and the optimum altitude increases

With respect to the optimum altitude, which of the following statements is correct?

A) An aeroplane flies most of the time above the optimum altitude because this yields the most economic result

B) An aeroplane sometimes flies above or below the optimum altitude because optimum altitude increases continuously during flight

C) An aeroplane always flies below the optimum altitude, because Mach buffet might occur

D) An aeroplane always flies at the optimum altitude because this is economically seen as the most attractive altitude

The effect of flying at the Long Range Cruise speed instead of the Maximum Range Cruise speed is:

A) fuel flow is increased and speed stability is reduced

B) fuel flow is increased and speed stability is improved

C) fuel flow is reduced and speed stability is improved

D) fuel flow is reduced and speed stability is reduced

The optimum altitude for a turbojet is:

A) where fuel consumption is highest

B) when the TAS at the buffet boundary is greatest

C) when specific range is a maximum

D) when the stall speed equals VPmin

If a flight is performed with a higher " Cost Index" at a given mass which of the following will occur?

A) A lower cruise mach number

B) A better maximum range

C) A better long range

D) A higher cruise mach number

The tangent from the origin to the Power-speed curve will give the speed for (jet aircraft):

A) maximum range

B) maximum endurance

C) minimum power

D) maximum speed

Which of the following statements is correct with regard to increasing altitude?

A) Low speed margin increases, high speed margin increases

B) Low speed margin decreases, high speed margin decreases

C) The low speed buffet margin increases, and the high speed buffet margin decreases

D) Low speed margin decreases, high speed margin increases

For a jet engine without limiters, thrust will increase as a result of:

A) Decreased pressure altitude

B) Increased ambient temperature

C) Increased pressure altitude

D) Increased atmospheric humidity

Under which conditions would VMC be lowest?

A) Low temperatures, high pressure altitudes, low humidity
B) High temperatures, high pressure altitudes, high humidity
C) Low temperatures, low pressure altitudes, low humidity
D) High temperatures, low pressure altitudes, high humidity

It may be advantageous to fly below the optimum range altitude because:

A) speed stability is better
B) a more favourable wind may give a greater ground distance
C) higher temperatures give better engine efficiency
D) cruising at the optimum altitude may give high speed buffet

The optimum cruise altitude is:

A) the pressure altitude up to which a cabin altitude of 8000 ft can be maintained
B) the pressure altitude at which the fuel flow is a maximum
C) the pressure altitude at which the speed for high speed buffet as TAS is a maximum
D) the pressure altitude at which the best specific range can be achieved

Most jet aircraft cruise at.... of their maximum RPM.

A) 65% to 70%
B) 70% to 75%
C) 75% to 85%
D) 85% to 90%

Which of the following factors determines the maximum flight altitude in the " Buffet Onset Boundary" graph?

A) Aerodynamics
B) Service ceiling
C) Theoretical ceiling
D) Economy

Compared to the maximum range cruise speed, the long range cruise speed is:

A) Higher
B) It depends on the pressure altitude and gross mass
C) It depends on the outside air temperature and gross mass
D) Lower

At maximum range speed in a turbojet the angle of attack is:

A) more than L/D max
B) less than L/D max
C) same as L/D max
D) maximum

81. Vne is defined as the:

A) never exceed speed with gear extended
B) never exceed speed in turbulence
C) for best rate of climb
D) never exceed speed, which must not be higher than 0.9 times Vd

Two identical turbojet aeroplanes (whose specific fuel consumption is assumed to be constant) are in a holding pattern at the same altitude. The mass of the first one is 95 000 kg and its hourly fuel consumption is equal to 3100 kg/h. Since the mass of the second one is 105 000 kg, its hourly fuel consumption is:

A) 3426 kg/h
B) 3787 kg/h
C) 3259 kg/h
D) 3602 kg/h

For a jet transport aeroplane, which of the following is the reason for the use of 'maximum range speed'?

A) Longest flight duration
B) Minimum specific fuel consumption
C) Minimum fuel flow
D) Minimum drag

The speed for minimum power in a turbojet will be:

A) the same as the speed for minimum drag
B) slower in a climb and faster in a descent
C) faster than the speed for minimum drag
D) slower than the speed for minimum drag

With regards to the optimum altitude during the cruise, the aircraft is:

A) flown as close to the optimum altitude as ATC will allow
B) may be flown above or below the optimum altitude, but never at the optimum altitude
C) always flown 2000 ft below the optimum altitude
D) always flown at the optimum altitude

Gross fuel flow is equal to:

A) Fuel used / ground speed
B) Fuel flow / TAS
C) Fuel flow / ground speed
D) Fuel flow x TAS

The tangent from the origin to the Drag-Speed curve will give, for a jet aircraft, the speed for:

A) minimum power required
B) maximum range
C) maximum endurance
D) minimum drag

After engine failure the aeroplane is unable to maintain its cruising altitude. What is the procedure which should be applied?

A) ETOPS
B) Emergency Descent Procedure
C) Drift Down Procedure
D) Long Range Cruise Descent

Aft centre of gravity (within the approved limits):

A) Decreases maximum range
B) Improves longitudinal stability
C) Increases maximum range
D) Increases stalling speed

At constant thrust and constant altitude the fuel flow of a jet engine:

A) increases slightly with increasing airspeed
B) decreases slightly with increasing airspeed
C) is independent of the airspeed
D) increases with decreasing OAT

If the calculations for an aeroplane of 3250lb indicate a service ceiling of 4000m. What will the service ceiling be for an aircraft with a weight of 3000lb?

A) the same
B) higher
C) higher or lower, more information is needed
D) lower

With one or two engines inoperative the best specific range at high altitudes is:

A) reduced
B) improved
C) first improved and later reduced
D) not affected

Which speed represents the manoeuvring speed?

A) Vne
B) Va
C) V1
D) Vlo

Which is true about flight on the back end of the 'power curve/drag curve'?

A) A stall is impossible
B) Less thrust is required
C) The aircraft cannot maintain altitude
D) The aircraft is speed unstable

A jet aeroplane is flying long range cruise. How does the specific range / fuel flow change?

A) Decrease / increase
B) Increase / decrease
C) Decrease / decrease
D) Increase / increase

Which of the following statements with regard to the optimum cruise altitude (best, fuel mileage) is correct?

A) An aeroplane always flies on the optimum cruise altitude, because this is most attractive from an economy point of view
B) An aeroplane sometimes flies above the optimum cruise altitude, because ATC normally does not allow to fly continuously at the optimum cruise altitude
C) An aeroplane always flies below the optimum cruise altitude, as otherwise Mach buffet can occur
D) An aeroplane usually flies above the optimum cruise altitude, as this provides the largest specific range

A jet aeroplane is performing a maximum range flight. The speed corresponds to:

A) the minimum drag
B) the point of contact of the tangent from the origin to the power required (Pr) versus TAS curve
C) the point of contact of the tangent from the origin to the Drag versus TAS curve
D) the minimum required power

With respect to en-route diversions (using drift down graph), if you believe that you will not clear an obstacle do you must:

A) fly slightly faster
B) drift down to clearance height and then start to jettison fuel
C) jettison fuel from the beginning of the drift down
D) assess remaining fuel requirements, then jettison fuel as soon as possible

To obtain the maximum range for a jet aircraft it should be flown:

A) at the altitude which is the optimum for the mass at the top of descent
B) at a decreasing altitude as the mass decreases
C) at the altitude which is the optimum for the mass at the top of climb
D) at an increasing altitude as the mass decreases

During a cruise flight of a jet aeroplane at constant flight level and at the maximum range speed, the IAS / the drag will:

A) decrease / increase
B) increase / decrease
C) increase / increase
D) decrease / decrease

101. For a turbojet flying at maximum range speed the angle of attack...

A) will be less than that for the maximum L/D ratio
B) will be more than that for the maximum L/D ratio
C) will be that for CLMAX
D) will be that for the maximum L/D ratio

Net thrust is:

A) Gross thrust minus profile drag
B) Gross thrust minus total drag
C) Gross thrust minus momentum drag
D) Gross thrust minus induced drag

Which of the following parameters have an influence on high-speed buffeting?

A) Weight, angle of attack, temperature
B) Weight, load factor and pressure altitude
C) Temperature only
D) Weight only

Maximum endurance for jet aircraft are found:

A) slightly above the speed for minimum drag
B) where maximum fuel consumption is maintained
C) where power require to maintain level flight is minimum
D) where thrust require to maintain level flight is minimum

The intersections of the thrust available and the drag curve are the operating points of the aeroplane:

A) in un-accelerated level flight
B) in descent with constant IAS
C) in accelerated level flight
D) in un-accelerated climb

The specific fuel consumption (sfc) for a jet engine is best (lowest) at:

A) low altitude and high rpm
B) high altitude and high rpm
C) high altitude and low rpm
D) low altitude and low rpm

The airspeed for jet aeroplanes at which power required is a minimum:

A) is always lower than the minimum drag speed
B) is the same as the minimum drag speed
C) is lower than the minimum drag speed in the climb and higher than the minimum drag speed in the descent
D) is always higher than the minimum drag speed

For a jet aircraft to travel a given distance, the speed to be flown that would result in the least amount of fuel being used would be:

A) the speed for minimum power
B) the speed for maximum range
C) the speed for minimum drag
D) the speed for minimum fuel flow

Consider the graphic representation of the power required versus true air speed (TAS), for a jet aeroplane with a given mass. When drawing the tangent out of the origin, the point of contact determines the speed of:

A) maximum endurance
B) minimum power
C) critical angle of attack
D) maximum specific range

The thrust of a jet engine at constant RPM:

A) is inversely proportional to the airspeed
B) increases in proportion to the airspeed
C) does not change with changing altitude
D) is independent of the airspeed

With zero wind, the angle of attack for maximum range for an aeroplane with turbojet engines is:

A) equal to that corresponding to zero induced drag
B) equal to that maximum endurance
C) lower than that of maximum lift to drag ratio
D) equal to that of maximum lift to drag ratio

The buffet onset boundary chart tells the pilot:

A) values for low speed stall and mach buffet onset for various masses and altitudes
B) critical mach number for various masses and altitudes
C) maximum operating MMO for various masses and altitudes
D) Mach number for low speed stall and shock stall for various masses and altitudes

As speed is reduced below VMD:

A) drag increases and speed stability decreases
B) drag increases and speed stability increases
C) drag decreases and speed stability increases
D) drag decreases and speed stability decreases

Which of the following statements is correct with regard to cruising speed:

A) Maximum cruise speed is always limited by maximum cruise thrust available
B) Maximum cruise speed is always limited by a Mach number limitation
C) Maximum achievable cruise speed is not affected by weight
D) Maximum cruise speed may be limited by maximum cruise thrust available, MMo, or VMo

Two identical turbojet aeroplane (whose specific fuel consumptions are considered to be equal) are at holding speed at the same altitude.
The mass of the first aircraft is 130 000 kg and its hourly fuel consumption is 4300 kg/h.
The mass of the second aircraft is 115 000 kg and its hourly fuel consumption is:

A) 3578 kg/h
B) 3365 kg/h
C) 3804 kg/h
D) 4044 kg/h

The drift down procedure specifies requirements concerning the:

A) obstacle clearance during descent to the net level-off altitude
B) engine power at the altitude at which engine failure occurs
C) weight during landing at the alternate
D) climb gradient during the descent to the net level-off altitude

Moving the centre of gravity from the forward to the aft limit (gross mass, altitude and airspeed remain unchanged):

A) decreases the induced drag and reduces the power required
B) increases the induced drag
C) affects neither drag nor power required
D) increases the power required

A jet aircraft's maximum altitude is usually limited by:

A) it's pressurisation maximum altitude
B) the altitude at which low and high-speed buffet will occur
C) thrust limits
D) it's certification maximum altitude

'Drift down' is the procedure to be applied:

A) after cabin depressurization
B) after engine failure if the aeroplane is above the one engine out maximum altitude
C) to conduct an instrument approach at the alternate
D) to conduct a visual approach if VASI is available

An ETOPS aircraft is a twin engine aircraft which en-route is allowed to operate further from an adequate aerodrome which is:

A) within 60 minutes on all engines
B) within 30 minutes on all engines
C) within 75 minutes at single engine cruise speed
D) within 60 minutes at single engine cruise speed

121. When in a gliding manoeuvre, in order to achieve maximum endurance the aircraft should be flown at:

A) the speed for max. lift / drag
B) the speed for min. power
C) the speed for min. drag
D) the speed for max. lift

Given a constant cruising altitude and constant angle of attack (assuming no compressibility effects) higher gross mass:

A) Leads to increased coefficient of drag
B) Requires increased thrust and decreased corresponding speeds
C) Requires increased thrust and increased corresponding speeds
D) No increase in thrust is required, but increases corresponding speeds

Which data can be extracted from the Buffet Onset Boundary Chart?

A) The value of maximum operating Mach number (MMO) at various masses and power settings
B) The values of the Mach number at which low speed and Mach buffet occur at various masses and altitudes
C) The value of the Mach number at which low speed and shockstall occur at various weights and altitudes
D) The value of the critical Mach number at various masses and altitudes

When flying at high altitudes speed range becomes narrow due to:

A) speed of sound
B) low speed buffet onset decrease and high speed buffet increase
C) lack of oxygen
D) low speed buffet onset increase and high speed buffet decrease

A higher altitude at constant mass and Mach number requires

A) a lower angle of attack
B) a lower coefficient of drag
C) a higher angle of attack
D) a lower coefficient of lift

An engine fails at height. The subsequent drift down should be flown at:

A) the best Long Range Cruise speed
B) the best range speed
C) the best L/D ratio
D) the worst L/D ratio

Given a constant altitude. If the mass of a jet aeroplane is increased by 5% and assuming the engine specific fuel consumption remains constant, the hourly fuel consumption increases by approximately:

A) 10%
B) 0%
C) 5%
D) 2.5%

A jet aeroplane equipped with old engines has a specific fuel consumption of 0.06 kg per Newton of thrust and per hour and, in a given flying condition, a fuel mileage of 14 kg per Nautical Mile. In the same flying conditions, the same aeroplane equipped with modern engines with a specific fuel consumption of 0.035 kg per Newton of thrust and per hour, has a fuel mileage of:

A) 14 kg / NM
B) 11.7 kg / NM
C) 10.7 kg / NM
D) 8.17 kg / NM

An aircraft is flying straight and level at height. If the mass were increased what actions would be necessary to maintain a constant angle of attack and altitude?

A) Decrease speed, increase power
B) Increase speed, increase power
C) Decrease speed, decrease power
D) Increase speed, decrease power

At a constant Mach number the thrust and the fuel flow of a jet engine:

A) increase with increasing altitude
B) decrease in proportion to the ambient pressure at constant temperature
C) are independent of outside air temperature (OAT)
D) increase in proportion to the ambient pressure at constant temperature

The pilot of a jet aeroplane wants to use a minimum amount of fuel between two airfields. Which flight procedure should the pilot fly?

A) Long range
B) Maximum range
C) Maximum endurance
D) Holding

(Refer to CAP698 figure 4.3)
Given:
Pressure Altitude: 33000 ft
Indicated Mach Number: 0.87
Indicated TAT: -20° C
What is the Temperature Deviation from Standard?

A) -16.5° C
B) +16.5° C
C) +3.5° C
D) -3.5° C

For jet-engine aeroplanes, what is the effect of increased altitude on specific range?

A) Increases
B) Does not change
C) Decreases
D) Increases only if there is no wind

Absolute ceiling occurs...

A) on a jet aircraft when the rate of climb falls to 100ft/min
B) when the achievable rate of climb is zero
C) on a jet aircraft when the rate of climb falls to 750ft/min
D) on a jet aircraft when the rate of climb falls to 300ft/min

(Refer to CAP 698 Figure 4.5)
PMC is the:

A) Performance Mass Control
B) Propeller Management Computer
C) Power Management Computer
D) ICAO Possible Means of Compliance

Flying at an altitude close to coffin corner gives:

A) Greater 1 engine inoperative Endurance
B) Max speed
C) Greater 1 engine inoperative Range
D) Less manoeuvrability

Which statement with respect to the step climb is correct?

A) Executing a desired step climb at high altitude can be limited by buffet onset at g-loads larger than 1
B) A step climb is executed in principle when, just after levelling off, the 1.3g altitude is reached
C) A step climb is executed because ATC desires a higher altitude
D) A step climb must be executed immediately after the aeroplane has exceeded the optimum altitude

The drift down requirements are based on:

A) the obstacle clearance during a descent to the new cruising altitude if an engine has failed
B) the actual engine thrust output at the altitude of engine failure
C) the landing mass limit at the alternate
D) the maximum flight path gradient during the descent

An aircraft with 180 minutes ETOPS approval must be:

A) no more than 180 minutes from a suitable alternate, still air, at the one engine inoperative TAS
B) no more than 180 minutes from a suitable alternate, still air, at the all engine TAS
C) no more than 180 minutes from a suitable alternate in the prevailing conditions and using the one engine inoperative TAS
D) no more than 90 minutes from departure and 90 minutes from a suitable alternate, still air, at the one engine inoperative TAS

If the level-off altitude is below the obstacle clearance altitude during a drift down procedure:

A) fuel jettisoning should be started at the beginning of drift down
B) the recommended drift down speed should be disregarded and it should be flown at the stall speed plus 10 kt
C) fuel jettisoning should be started when the obstacle clearance altitude is reached
D) the drift down should be flown with flaps in the approach configuration

With a constant weight and Mach number, a higher altitude will require:

A) Lower CD
B) Higher AoA
C) Lower CL
D) No change

The optimum long-range cruise altitude for a turbojet aeroplane:

A) is always equal to the powerplant ceiling
B) is independent of the aeroplane mass
C) is only dependent on the outside air temperature
D) increases when the aeroplane mass decreases

Descent and landing:

The allowable landing weight will:
A) Is not affected by runway slope
B) Increase with uphill runway slope
C) Increase with runway contamination
D) Increase with downhill runway slope

An aircraft is descending in the troposphere from FL350 to FL250 at a constant Mach number, then from FL250 to FL100 at a constant CAS. What happens to the descent angle in each phase of the descent?
A) decreases; decreases
B) increases; increases
C) increases; constant
D) constant; constant

The aquaplaning speed :
A) is not affected by changes of contaminant density, but increases if tyre pressure decreases
B) is not affected by changes of contaminant density, but increases if tyre pressure increases
C) decreases if contaminant density increases, and tyre pressure decreases
D) increases if contaminant density increases, and tyre pressure decreases

The maximum mass for landing could be limited by:
A) the climb requirements with all engines in the approach configuration
B) the climb requirements with all engines in the landing configuration but with gear up
C) the climb requirements with one engine inoperative in the approach configuration
D) the climb requirements with one engine inoperative in the landing configuration

In a steady descending flight (descent angle GAMMA) equilibrium of forces acting on the aeroplane is given by:

T = Thrust
D = Drag
W = Weight
A) T + W sin GAMMA = D
B) T - W sin GAMMA = D
C) T + D = - W sin GAMMA
D) T - D = W sin GAMMA

For a turbo jet aircraft planning to land on a wet runway, the landing distance available :

A) may be less than 15% greater than the dry landing distance if the flight manual gives specific data for a wet runway
B) must always be at least 15% greater than the dry landing distance
C) may be less than 15% greater than the dry landing distance if permission is obtained from the relevant aerodrome authority
D) may be less than 15% greater than the dry landing distance if all reverse thrust systems are operative

Dynamic hydroplaning is likely to occur as a result of a combination of:

A) high speed, high tyre pressure, high contaminant density
B) high speed, low tyre pressure, high contaminant density
C) low speed, high tyre pressure, low contaminant density
D) high speed, high tyre pressure, low contaminant density

If the anti-skid system is inoperative:

A) the landing distance required will be unchanged because anti-skid is not taken account of in determining landing performance
B) the landing distance required will only increase on runways that are wet or precipitation covered
C) the landing distance required will increase
D) the landing distance required will decrease

What margin above the stall speed is provided by the landing reference speed VREF?

A) 1,05 VSO
B) 1,10 VSO
C) VMCA x 1,2
D) 1,30 VSO

Which of the following is not affected by a tailwind:

A) Tyre speed limit mass
B) Obstacle limit mass
C) Landing climb limit mass
D) VMBE

The lift coefficient decreases during a glide with constant Mach number, mainly because the:

A) IAS increases
B) aircraft mass decreases
C) TAS decreases
D) glide angle increases

You are in descent on a ILS with a constant CAS, compared with a nil wind situation, a tailwind will:

A) increase the distance travelled over the ground in a descent
B) decrease descent gradient
C) increase descent rate
D) decrease descent rate

A flight is planned with a turbojet aeroplane to an aerodrome with a landing distance available of 2400 m. Which of the following is the maximum landing distance for a dry runway?

A) 1 440 m
B) 1 655 m
C) 1 250 m
D) 1 090 m

By what factor must the landing distance available (dry runway) for a turbojet powered aeroplane be multiplied to find the landing distance required? (planning phase for destination)

A) 60/115
B) 115/100
C) 0.60
D) 1.67

Which of the following statements is correct?

A) VTH is the correct speed when crossing the R/W threshold
B) VTH is the correct touchdown speed
C) VTH is the max. speed for an aborted takeoff
D) VTH is the maximum speed for setting approach flaps

Decreasing air density will give:

A) increased landing distance due to increased TAS, and reduced idling thrust
B) reduced landing distance due to reduced TAS, and increased idling thrust
C) increased landing distance due to increased TAS, and increased idling thrust
D) reduced landing distance due to reduced TAS, and reduced idling thrust

For jet aeroplanes which of the following statements is correct?

A) In any case runway slope is one of the factors taken into account when determining the required landing field length
B) The required landing field length is the distance from 35 ft to the full stop point
C) An anti-skid system malfunction has no effect on the required landing field length
D) When determining the maximum allowable landing mass at destination, 60% of the available distance is taken into account, if the runway is expected to be dry

In dry conditions, when landing at an alternate airport in a turbojet by what factor should the landing distance available changed to give landing distance?

A) 1.43
B) 1.67
C) 1.0
D) 0.6

According to JAR-OPS 1, which one of the following statements concerning the landing distance for a turbojet aeroplane is correct?

A) Reverse thrust is one of the factors always taken into account when determining the landing distance required
B) The landing distance is the distance from 35 ft above the surface of the runway to the full stop
C) Malfunctioning of an anti-skid system has no effect on the required runway length
D) When determining the maximum allowable landing mass at destination, 60% of the available landing runway length should be taken into account

At maximum landing mass, the structure of the aircraft is designed for a rate of descent of

A) 250 fpm
B) 200 fpm
C) 600 fpm
D) 220 fpm

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21. In a turbo-prop aircraft you are planning to land at an airfield with a runway 2200m long. The runway will be wet on arrival. The equivalent dry runway distance to be used in planning is:

A) 1913m
B) 2200m
C) 2750m
D) 2530m

The maximum landing weight may be determined by the landing climb gradient requirement.
This is to ensure that (Class B multi engine):

A) there is adequate obstacle clearance during approach
B) the climb performance is adequate in the event of a go-around
C) the landing distance is not exceeded
D) manoeuvrability is adequate

Which of the following is not affected by tailwind?

A) Obstacle Limited Mass
B) VMBE
C) Landing Climb Limited Mass
D) Tyre Speed Limited Mass

(For this Question use CAP 698 Figure 4.28)
What is the minimum field length required for the worst wind situation, landing a twin jet aeroplane with the anti- skid inoperative? Given:

Elevation: 2000 ft
QNH: 1013 hPa
Landing mass: 50 000 kg
Flaps: as required for minimum landing distance
Runway condition: dry
Wind:
Maximum allowable tailwind: 15 kt
Maximum allowable headwind: 50 kt

A) 2700 m
B) 2900 m
C) 3100 m
D) 2600 m

To minimize the risk of hydroplaning during landing the pilot should:

A) use normal landing, braking and reverse technique
B) postpone the landing until, the risk of hydroplaning no longer exists
C) use maximum reverse thrust, and should start braking below the hydroplaning speed
D) make a " positive" landing and apply maximum reverse thrust and brakes as quickly as possible

May the whole runway always be used for landing?

A) Yes, unless marked with white crosses
B) No, obstacles in the approach area may decrease the usable part of the runway
C) Yes, if the actual A/C weight is less than max. all-up weight for the whole runway
D) Yes, unless closed due to work or damage

The approach climb requirement has been established so that the aeroplane will achieve:

A) minimum climb gradient in the event of a go-around with one engine inoperative
B) manoeuvrability during approach with full flaps and gear down, all engines operating
C) manoeuvrability in the event of landing with one engine inoperative
D) obstacle clearance in the approach area

The maximum demonstrated crosswind component is equal to 0.2 VSO and the following conditions exist at an airport of intended landing:

VSO 70 Kt
Landing Rwy 35
Wind 300° at 20 Kt

A) headwind component exceeds the crosswind component
B) maximum demonstrated crosswind component is exceeded
C) crosswind component is within safe limits
D) headwind component is excessive

Which of the following factors leads to the maximum flight time of a glide?

A) Low mass
B) Headwind
C) Tailwind
D) High mass

In wet conditions what extra percentage over the calculated (gross) landing distance must be available for a turbojet?

A) 43%
B) 92%
C) 15%
D) 67%

The landing requirements for a class A aircraft are :

A) a speed of not less than 1.3 V at a 50 ft screen
B) a speed of not less than 1.2 Vs at a 35 ft screen
C) a speed of not less than 1.3 Vs at a 35 ft screen
D) a speed of not less than 1.3 Vs at a 50 ft screen

The landing field length required for jet aeroplanes at the alternate (wet condition) is the demonstrated landing distance plus

A) 70%
B) 67%
C) 43%
D) 92%

Two identical aircraft, one with a light load and one with a heavy load, are in a glide descent from the same height in the same atmospheric conditions. The heavy aircraft will:

A) descend at a steeper angle at a faster speed at the same rate of descent
B) descend steeper, at a faster speed with a greater rate of descent
C) descend at the same angle with the same time in the descent but at a faster speed
D) require a faster speed to achieve the same descent angle as the lighter aircraft

When gliding into a headwind airspeed should be:

A) the same as the max. range glide speed in still air
B) higher than the max. range glide speed in still air
C) lower than the max. range glide speed in still air
D) reduced to gust penetration speed

In addition to other requirements, the approach climb requirement is based on:

A) all engines, flaps APPROACH and gear UP
B) one engine out, flaps LAND and gear UP
C) one engine out, flaps APPROACH and gear UP
D) one engine out, flaps APPROACH and gear DOWN

In a constant Mach descent which one of the following speeds will be exceeded first?

A) VNE
B) MMO
C) VD
D) VMO

For performance Class A aircraft when calculating the landing mass the runway slope must be taken into account when it:

A) Exceeds ± 2%
B) Exceeds +2%
C) Exceeds ± 5%
D) Exceeds -2%

During the landing run with wheel brakes applied and engines in reverse thrust, as the speed decreases :

A) the wheel brake drag remains constant, reverse thrust becomes less effective
B) the wheel brakes become les s effective, reverse thrust becomes more effective
C) the wheel brakes become more effective, reverse thrust becomes less effective
D) the wheel brakes become less effective, reverse thrust becomes less effective

For turbojet aircraft weighing more than 5700 kg in transport CAT when landing on wet runways, the runway length must be at least:

A) 115 % of the runway length established under normal conditions
B) 60 % increment
C) 167 % of the runway length established under normal conditions
D) no increment needed

An aircrafts descent speed schedule is 0.74 M / 250 KIAS. During the descent from 30000 ft to sea level, the angle of attack will :

A) decrease, then remain constant
B) increase, then remain constant
C) remain constant
D) decrease

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41. Which of the following statements regarding reverse thrust is true?

A) At low speeds re-ingestion of the jet efflux may occur, causing overheat
B) Reverse thrust may be used for landing but not for an aborted take-off
C) The braking effect of reverse thrust is greatest at low speeds
D) Reverse thrust may not be used on a slippery runway

An aeroplane carries out a descent from FL 410 to FL 270 at cruise Mach number, and from FL 270 to FL 100 at the IAS reached at FL 270. How does the angle of descent change in the first and in the second part of the descent? Assume idle thrust and clean configuration and ignore compressibility effects.

A) Decreases in the first part; increases in the second
B) Is constant in the first part; decreases in the second
C) Increases in the first part; is constant in the second
D) Increases in the first part; decreases in the second

Vref is defined as:

A) A referenced airspeed obtained after lift-off at which the required one-engine-inoperative climb performance can be achieved
B) The take-off decision speed
C) The speed of the aeroplane that exists at the end of the take-off path in the enroute configuration with one engine inoperative
D) The speed of an aeroplane, in a specified landing configuration, at the point where it descends through the landing screen height in the determination of the landing distance for manual landings

Which of the following statements relating to hydroplaning is true?

A) Hydroplaning can only occur if the depth of the contaminant exceeds 3mm
B) Hydroplaning can be delayed by reducing the tyre pressure
C) Hydroplaning can only occur if the brakes are applied and releasing the brakes will stop the hydroplaning
D) When the wheel begins to hydroplane the wheel drag decreases

What is the minimum landing threshold clearance height for calculating landing distance?

A) 5 m
B) 50 m
C) 50 feet
D) 5 feet

A constant headwind:

A) increases the rate of descent
B) increases the angle of the descent flight path
C) increases the angle of descent
D) increases the descent distance over ground

What are the three types of hydroplaning?

A) Viscous, aerodynamic, rubber
B) Dynamic, viscous, high speed
C) Dynamic, reverted rubber, viscous
D) Low, medium, high

To meet the balked landing requirements an aircraft must achieve a climb gradient of :
A) 2.1% in the landing configuration with all engines operating
B) 3.2% in the landing configuration with all engines operating
C) 3.2% in the landing configuration with the critical engine inoperative
D) 2.1% in the approach configuration with all engines operating

Required runway length at destination airport for turboprop aeroplanes:
A) is more than at an alternate airport
B) is less then at an alternate airport
C) is 60% longer than at an alternate airport
D) is the same as at an alternate airport

An aircraft is descending at a constant Mach number. The IAS (i) and the TAS (ii) will :
A) k(i) decrease (ii) increase
B) k(i) decrease (ii) decrease
C) k(i) increase (ii) decrease
D) k(i) increase (ii) increase

Which speed represents maximum landing gear extended speed?
A) Vle
B) Vfe
C) Vlo
D) Va

An aircraft is descending at 193kt TAS in still air with a vertical speed of 1000ft/min. The descent gradient is:
A) 6.5%
B) 4.8%
C) 5.4%
D) 5.1%

For turboprop aircraft >5700 kg in transport CAT, the runway length requirements for landing at the alternate airport is:
A) 115 % of runway length available
B) 70 % of runway length available
C) 67 % of runway length available
D) 60 % of runway length available

During a glide at constant Mach number, the pitch angle of the aeroplane will:
A) increase
B) decrease
C) remain constant
D) increase at first and decrease later on

Descending from cruising altitude to ground level at a constant IAS in a headwind, compared to still air conditions, will:

A) reduce the time to descend
B) increase the time to descend
C) reduce the fuel used in the descent
D) reduce the ground distance taken

Which speed represents maximum flap extended speed?

A) Vlof
B) Vfc
C) Va
D) Vfe

The correction factor for landing distance required on a runway with a 1% downslope is:

A) + 15%
B) x 1.43
C) x 1.05
D) x 1.15

The speed VLO is defined as:

A) the speed at which the aircraft leaves the ground, not more than V2 and not less than VR
B) the maximum speed for extending or retracting the landing gear
C) the minimum speed in the landing configuration with one engine inoperative at which it is possible to maintain control of the aeroplane within defined limits whilst applying varying power
D) the stall speed in the landing configuration

When calculating approach speeds, the minimum approach speed in the initial approach phase is usually:

A) 1,3 times Vthv
B) 1,3-1,4 times Vs1
C) 1,1-1,2 times Vs1
D) 1,4-1,5 times Vs1

For a turbojet aeroplane, what is the maximum landing distance for wet runways when the landing distance available at an aerodrome is 3000 m?

A) 2609 m
B) 1565 m
C) 1800 m
D) 2070 m

61. Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?

A) A tailwind component increases the ground distance
B) A headwind component increases the ground distance
C) A tailwind component increases fuel and time to descent
D) A tailwind component decreases the ground distance

For a class A jet aircraft, the landing distance required must not exceed:

A) 60 percent of the landing distance available
B) 70 percent of the landing distance available
C) 50 percent of the landing distance available
D) 90 percent of the landing distance available

An aircraft has two certified landing flaps positions, 25° and 35° .
If a pilot chooses 25° instead of 35° , the aircraft will have:

A) an increased landing distance and better go-around performance
B) a reduced landing distance and better go-around performance
C) a reduced landing distance and degraded go-around performance
D) an increased landing distance and degraded go-around performance

For multiengine aircraft weighing less than 5700 kg in normal CAT, the landing distance required on destination must not exceed:

A) 0.7 x landing distance available
B) 0.6 x landing distance available
C) 1.67 x landing distance available
D) 1.43 x landing distance available

Is there any difference between the vertical speed versus forward speed curves for two identical aeroplanes having different masses? (assume zero thrust and wind)

A) Yes, the difference is that the heavier aeroplane will always glide a greater distance
B) Yes, the difference is that for a given angle of attack both the vertical and forward speeds of the heavier aeroplane will be larger
C) No difference
D) Yes, the difference is that the lighter aeroplane will always glide a greater distance

The required landing distance available in category A for landing is equal to:

A) 2.0 x the distance from touchdown to a complete stop
B) 1.15 x the distance from 35 ft. height to stop, using the wheel brakes and reversing
C) A landing distance available which, multiplied by 0.60 gives the landing distance, the landing distance being the distance from 50 ft. to complete stop
D) The distance from 50 ft to complete stop, using wheel brakes only

The force exactly opposing and balancing lift in a glide descent is:
A) Thrust x SINE angle of descent
B) Weight x SINE angle of descent
C) Weight x COSINE angle of descent
D) Thrust x COSINE angle of descent

Approaching in turbulent wind conditions requires a change in the landing reference speed (VREF):
A) Keeping same VREF because wind has no influence on IAS
B) Increasing VREF and making a steeper glide path to avoid the use of spoilers
C) Increasing VREF
D) Lowering VREF

The landing distance required will be decreased as a result of:
A) low aircraft mass, high air density, uphill runway slope
B) low aircraft mass, lower air density, uphill runway slope
C) higher aircraft mass, higher air density, downhill runway slope
D) higher aircraft mass, higher air density, uphill runway slope

In high density the landing TAS and distance will be:
A) higher / shorter
B) lower / shorter
C) lower / remains
D) higher / remains

An aircraft has a descent gradient of 4.8 percent with the engine inoperative. What is the distance travelled during a height loss of 2000 ft:
A) 7.65 NM
B) 68 NM
C) 6.8 NM
D) 4.2 NM

An aircraft with a stalling speed of 100kt TAS on the approach should cross the threshold at:
A) 115 kts
B) 100 kts
C) 130 kts
D) 110 kts

Pitch angle during decent at a constant mach number will:
A) stay constant
B) increase
C) decrease
D) increase at first then decrease

For Performance Class A aircraft conducting short landing operations the maximum ground slope of the declared safe area must not exceed:

A) 2% up or 2% down in the direction of landing
B) 5% up or 5% down in the direction of landing
C) 2% up or 5% down in the direction of landing
D) 5% up or 2% down in the direction of landing

For an aircraft powered by turbo-prop engines the landing distance required at an alternate will be:

A) less than that required at a destination aerodrome
B) the same as that required at a destination aerodrome
C) more than that required at a destination aerodrome
D) either less than that required at a destination aerodrome or the same depending on whether or not an alternate aerodrome has been designated in the flight plan

The landing field length required for turbojet aeroplanes at the destination (wet condition) is the demonstrated landing distance plus:

A) 70%
B) 92%
C) 43%
D) 67%

Which of the following will not increase the minimum glide angle relative to the ground :

A) increased headwind
B) increased weight
C) lowering the landing gear
D) increased flap angle

A jet aeroplane descends with constant Mach number. Which of the following speed limits is most likely to be exceeded first?

A) Maximum Operational Mach Number
B) Maximum Operating Speed
C) High Speed Buffet Limit
D) Never Exceed Speed

With all engines out, a pilot wants to fly for maximum time. Therefore he has to fly the speed corresponding to:

A) the minimum angle of descent
B) the maximum lift
C) the minimum drag
D) the critical Mach number

Two identical aircraft, one with a light load and one with a heavy load are in an idle power descent, form the same height. Both experiencing the exact same atmospheric conditions. The heavy aircraft will:

A) have a reduced descent range, and will have to use a faster speed in order to minimise the lost in range
B) descent steeper, at a faster speed and with a greater rate of descent
C) need to use a faster speed in order to achieve the same descent angle as the light aircraft
D) have the same descent range and endurance, but using a faster speed

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81. Which of the following statements is correct with regard to the approach to landing climb requirements?

A) These requirements are based on the following configuration: flaps in landing position and landing gear retracted
B) These requirements are more easily accomplished with two-engine aeroplane than with a four-engine aeroplane
C) These requirements can not be accomplished with masses higher than maximum approved landing masses
D) Fuel dumping may be necessary in emergency situation

When changing from a constant Mach no. descent to a constant IAS descent, the gradient of descent will:

A) Change from decreasing to remain constant
B) Change from decreasing to a greater rate of decrease
C) Change from increasing to a greater rate of increase
D) Change from increasing to remain constant

Which statement is correct for a descent without engine thrust at maximum lift to drag ratio speed?

A) The higher the average temperature (OAT) the lower is the speed for descent
B) The mass of an aeroplane does not have any effect on the speed for descent
C) The higher the gross mass the greater is the speed for descent
D) The higher the gross mass the lower is the speed for descent

Displaced threshold is calculated by:

A) the1:05 rule
B) the 1:20 rule
C) the1:15 rule
D) the 1:25 rule

Which wind component are you allowed to use when determining the required runway length for landing?

A) 150% head wind and 50% tail wind
B) 50% head wind and 150 % tail wind
C) 50% head wind and 100% tail wind
D) 100% head wind and 100% tail wind

A change in aeroplane weight affects:

A) Neither glide angle nor glide speed
B) Glide angle and glide speed
C) Glide angle
D) Glide speed

How does airplane weight influence best angle of glide?

A) It depends on the type of airplane
B) Glide angle decreases with airplane weight
C) Glide angle is not affected by airplane weight
D) Glide angle increases with airplane weight

Compared to the landing distance to be available at a destination aerodrome, the minimum distance to be available at an alternate aerodrome, for the same conditions of weight, altitude, and temperature, must be :

A) the same
B) 105%
C) 115%
D) 95%

The landing climb requirement is established to safeguard:

A) Manoeuvrability in case of an overshoot
B) Obstacle clearance in the overshoot area
C) Obstacle clearance in the approach and overshoot area
D) Obstacle clearance in the approach direction

For an aircraft with a tyre pressure of 130 lb/sq.in, the aquaplaning speed on a runway contaminated by 5 mm of standing water would be:

A) 46 knots
B) 80 knots
C) 130 knots
D) 103 knots

Which of the following is true according to JAA regulations for turbo propeller powered aeroplanes not performing a steep approach?

A) Maximum Take-off Run is 0,5 x runway.
B) Maximum Landing Distance at the destination aerodrome and at any alternate aerodrome is 0,7 x LDA (Landing Distance Available).
C) Maximum use of clearway is 1,5 x runway.
D) Maximum Landing Distance at destination is 0,95 x LDA (Landing Distance Available).

Descending at a constant Mach No. in a normal atmosphere:

A) The angle of attack must be decreased and the pitch angle decreased
B) The angle of attack must be increased and pitch angle increased
C) The angle of attack must be increases and the pitch angle decreased
D) The angle of attack must be decreased and the pitch angle increased

In wet conditions, what extra percentage over the calculated landing distance must be available for a turbojet?

A) 92%
B) 15%
C) 67%
D) 43%

The effective runway length to be used for landing weight calculation is equal to the runway length, which starts from the point at which an inclined plane clearing all obstacles in the approach area intersects the runway. This plane has the approximate slope of:

A) 4°
B) 2°
C) 3°
D) 5°

During a descent at constant Mach Number, the margin to low speed buffet will:

A) increase, because the lift coefficient increases
B) increase, because the lift coefficient decreases
C) decrease, because the lift coefficient decreases
D) remain constant, because the Mach number remains constant

Practical application of an airplane performance manual:

(Refer to CAP 698 Figure 4-5)
This figure shows the climb limited-take off mass. Take off at a mass not exceeding that given by Figure 4-5 will ensure:

A) that take off obstacles will be cleared
B) that the minimum climb gradient requirement will be achieved with one engine inoperative
C) that the minimum climb gradient requirement will be achieved with all engines operating
D) that the take off distance available will not be exceeded

(Use CAP 698 figure 4.7)
Find the brake energy limited take-off mass for the following take-off conditions:
Pressure altitude: 4000 ft
Temperature: 25 degrees Celsius
Take-off flap: 5
A/C: Auto
PMC: Off
Reported wind component: 15kts head
Runway slope: 1.5 percent downhill
Take-off mass: 65000 kg

A) 157.5kts
B) 160.5kts
C) 153.5kts
D) 162.5kts

(Refer to CAP 698 - figure 4-5)
Given:
Aerodrome Pressure Altitude: 4000ft
Ambient Temperature: +40° C
A/C: on
PMC: on
Anti-ice: off
15° Flap
Determine the climb limited TOW for an MRJT:

A) 46000 kg
B) 47200 kg
C) 48000 kg
D) 49500 kg

(Refer to CAP 698 figure 4.23)
Find the maximum mass at which a net level-off altitude of 17000 ft can be maintained in case of engine failure (ISA+15° C, A/C AUTO):

A) 48500 Kg
B) 51000 Kg
C) 53200 Kg
D) 50700 Kg

(CAP 698 figure 4.5)
Find the maximum take-off mass determined by the climb requirement for the following take-off conditions:
Pressure altitude: 3500 ft
Temperature: 30 degrees Celsius
Take-off flap: 15
A/C: Auto
PMC: On

A) 56000kg
B) 53500kg
C) 51600kg
D) 60200kg

What information would you get from the onset buffet graph?

A) It indicates the likely stall speed
B) It gives the minimum speeds to avoid buffet
C) It defines the boundaries of the manoeuvring envelope
D) It gives the speed at which high speed buffet will occur

(Refer to CAP698 figure 4.29)
At a pressure altitude of 5000 ft for temperatures below 20° C, the climb limited landing mass is approximately constant. This is due to :

A) the climb speed becoming limited by Vmcl
B) the engine acceleration time exceeding 8 seconds
C) the engines becoming flat rated
D) allowance being made for anti-ice operation

(Refer to CAP 698 figure 4-9 & V-speeds table)
Given:
Aerodrome Pressure Altitude: 4000 ft
Ambient Temperature: +30° C
Runway slope: 2% up
Wind Component: 40 kts Head
Flap setting: 15°
AC: on
Contaminant: 4 mm water
Take-off weight: 48000 kgs
TORA: 6200 ft
The maximum abandonment speed is:

A) 107 kts
B) 131 kts
C) 113 kts
D) 123 kts

What is meant by 'Equivalent Weight' in figure 4.27 of CAP 698?

A) The weight compensated for temperatures greater than ISA+10º C
B) The weight compensated for the fuel reduction before engine failure
C) The weight compensated for fuel density at different heights
D) The weight compensated for temperatures of ISA+10º and below

(Refer to CAP 698 figure 4-6)
Given:
Aerodrome Pressure Altitude: 4000 ft
Ambient Temperature: +10° C
Wind Component: 20 kts Head
Flap setting: 5°
PMC: on
Tyre Speed Rating: 210 mph
The tyre speed-limited TOW is:
A) 84,200 kgs
B) 88,800 kgs
C) 79,200 kgs
D) 71,200 kgs

Which of the following documents would be used in determining the minimum acceptable performance requirements for a CLASS A aircraft:
A) FAR 25
B) JAR 25
C) OPS Manual 3B
D) JAR FCL 2

(CAP 698 figure 4-4)
For a twin engine aircraft, which can use either 5 or 15 degrees flap setting, using the attached chart, what is the maximum field limited take off mass, given the following conditions:
Pressure Altitude: 7000 ft
OAT: -10° C
Length available: 2400 m
Slope: Level
Wind: Calm
A) 52000kg
B) 44000kg
C) 55000kg
D) 56000kg

All turbojet aircraft are certified under JAR... performance class...
A) OPS, B
B) 25, A
C) 25, D
D) 23, C

(Refer to CAP 698 figure 4.23)
Find the maximum mass at which a net level-off altitude of 13000 ft can be maintained in case of engine failure (ISA+20° C, A/C AUTO):
A) 54000 Kg
B) 54500 Kg
C) 59500 Kg
D) 57000 Kg

The minimum acceptable performance requirements for a Class A aeroplane are contained in the following document:

A) JAR-OPS
B) JAR27
C) JAR25
D) JAR23

(Refer to CAP 698 figure 4-5)
Consider the take-off performance for the twin jet aeroplane climb limit chart. Why has the wind been omitted from the chart?

A) The effect of the wind must be taken from another chart
B) The climb limit performances are taken relative to the air
C) There is a built-in safety measure
D) There is no effect of the wind on the climb angle relative to the ground

(For this question use CAP 698 Figure 4.5)
With regard to the take-off performance of a twin jet aeroplane, why does the take-off performance climb limit graph show a kink at 30° C, pressure altitude 0?

A) At higher temperatures the VMBE determines the climb limit mass
B) At lower temperatures one has to take the danger of icing into account
C) The engines are pressure limited at lower temperature, at higher temperatures they are temperature limited
D) At higher temperatures the flat rated engines determines the climb limit mass

(Refer to CAP 698 figure 4-8 & V-speeds table)
Given:
Aerodrome Pressure Altitude: 4000 ft
Ambient Temperature: +30° C
Runway slope: 1% uphill
Wind Component: 5 kts Tail
Take-off weight: 55000 kgs
Flap setting: 5°
AC: on
PMC: on
Calculate VMCG and V1 for the MRJT:

A) 107kts; 140kts
B) 107kts; 141kts
C) 104kts; 130kts
D) 104kts; 141kts

(Refer to CAP698 figure 4.29)
The climb limited landing mass at an aerodrome with a pressure altitude of 4000 ft and a temperature of 10° C with a flap setting of 30° and A/C packs off would be :

A) 63110 kg
B) 62110 kg
C) 61800 kg
D) 60800 kg

(Refer to CAP 698 figure 4.23)
What is the reason for the change in temperature lines at 17000ft?

A) It is the height below which engine relighting is permitted
B) It is a correction for the fact that the manual uses JET ISA rather than Standard ISA
C) It is the altitude below which it is not permitted to use A/C set to HIGH
D) It is the altitude above which the temperature remains constant

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31. (Refer to CAP 698 figure 4-24)
With regard to the drift down performance of the twin jet aeroplane, why does the curve representing 35 000 kg gross mass in the chart for drift down net profiles start at approximately 3 minutes at FL370?

A) Because at this mass it takes about 3 minutes to decelerate to the optimum speed for drift down at the original cruising level
B) Due to higher TAS at this mass it takes more time to develop the optimal rate of descent, because of the inertia involved
C) Because at this mass the engines slow down at a slower rate after failure, there is still some thrust left during three minutes
D) All the curves start at the same point, which is situated outside the chart

(Figure 4.4 in CAP 698)
What is the maximum brake release weight, given there is no slope and no wind?
Flap setting: 15°
OAT: +25º C
Aerodrome Pressure Altitude: 2300 ft
Field length available: 8000 ft

A) 62,000kg
B) 59,500kg
C) 58,500kg
D) 61,000kg

(Refer to CAP 698 figure 4-6)
Given:
Aerodrome Pressure Altitude: 6000 ft
Ambient Temperature: -10° C
Wind Component: 10kts Tail
Flap setting: 15°
PMC: off
Tyre speed rating: 210 mph
The tyre speed-limited TOW for the MRJT is:

A) 72,030 kgs
B) 73,800 kgs
C) 80,300 kgs
D) 78,630 kgs

(For this Question use CAP 698 figure 4-24)
With regard to the drift down performance of the twin jet aeroplane, what is meant by " equivalent gross weight at engine failure" ?

A) The equivalent gross weight at engine failure is the actual gross weight corrected for OAT higher than ISA +10° C
B) The increment represents fuel used before engine failure
C) The increment accounts for the higher fuel flow at higher temperatures
D) This gross weight accounts for the lower Mach number at higher temperatures

(Refer to CAP 698 figures 4.14)
Given:
Aerodrome Pressure Altitude: 4000 ft
Ambient Temperature: +30Â° C
TORA: 6200 ft
Runway slope: 2% up
Wind Component: 40kts Head
Flaps: 15Â°
AC: on
Contaminant: 4mm water
Take-off weight: 48000 kgs
The maximum contaminated runway TOW is:

A) 48000 kgs
B) 45000 kgs
C) 41700 kgs
D) 43000 kgs

(Refer to CAP 698 figure 4.23)
Find the maximum mass at which a net level-off altitude of 20000 ft can be maintained in case of engine failure (ISA+10° C, A/C AUTO):

A) 48 000 Kg
B) 45 000 Kg
C) 47 000 Kg
D) 49 000 Kg

(Refer to CAP 698 figure 4-7)
Given:
Aerodrome Pressure Altitude: 3000 ft
Ambient Temperature: +30° C
Runway slope: 2% down
Wind Component: 10 kts Tail
PMC: on
Take-off weight: 68000 kgs
V1: 135kts
Calculate VMBE limited TOW.

A) 65000 kgs
B) 66500 kgs
C) 67700 kgs
D) 67100 kgs

How is wind considered in the take-off performance data of the Aeroplane Operations Manuals?

A) Not more than 50% of a headwind and not less than 150% of the tailwind
B) Since take-offs with tailwind are not permitted, only headwinds are considered
C) Not more than 80% headwind and not less than 125% tailwind
D) Un-factored headwind and tailwind components are used

(Use CAP 698 figure 4.4)
What minimum balanced field length must be available for take-off at a mass of 56000kg, for the following conditions:

Pressure altitude: 4000 ft
Temperature: 20 degrees C
Reported wind component: 20kts head
Runway slope: 1 percent downhill
Take-off flap: 15
A/C: Auto
PMC: On

A) 6300ft
B) 8500ft
C) 4500ft
D) 8000ft

(Refer to CAP 698 figure 4-4)
Given:
Aerodrome Pressure Altitude: 4000 ft
Ambient Temperature: +10° C
TODA: 7000 ft
Runway slope: 1% Down
Wind Component: 5 kts Head
AC: on
Anti-icing: on
PMC: on

The field-length limited TOW is:

A) 59000 kgs
B) 53000 kgs
C) 57000 kgs
D) 55000 kgs