Status	Finished
Started	Tuesday, 9 September 2025, 4:12 PM
Completed	Tuesday, 9 September 2025, 5:55 PM
Duration	1 hour 43 mins
Marks	26.00/30.00
Grade	**86.67** out of 100.00
Feedback	You have successfully passed this test.

Question 1

Correct

Mark 1.00 out of 1.00

Wake turbulence is caused by tip vortices. The vortices migrate _____ and eventually stabilise at a vertical distance of about _____ ft from the aircraft.

- upwards; 900.
- downwards; 2000.
- downwards; 900. ✓ Great job!
- downwards; 250.

The correct answer is: downwards; 900.

Question 2

Correct

Mark 1.00 out of 1.00

Because drag is related to _____ _____ altitude has no effect on the position of the total drag curve.

- Static pressure
- Induced pressure.
- Dynamic pressure. ✓ Great job!
- Total pressure.

The correct answer is: Dynamic pressure.

Question 3

Incorrect

Mark 0.00 out of 1.00

Which of the following wing planforms produces an increase in downwash towards the wingtip?

- rectangular.
- elliptical.
- taped.
- sweepback. ⊗ Not quite. Please review the lesson contents.

A rectangular planform has increased downwash towards the wingtip.

An elliptical planform has constant level of downwash across the wing.

A tapered wing has a slight increase in downwash towards the wing root and a significant increase in downwash towards the wingtip - but the optional answer states 'taped' not 'tapered'. There is no such thing as a taped planform - be careful of subtle changes to word spelling in exam questions, which may change the meaning of the distractor (incorrect answer).

A sweepback wing has greatest downwash at the wing root, reducing towards the wingtip. While the downwash increases AT the wingtip, the question does not ask what happens AT the wingtip - it asks what happens TOWARDS the wingtip. You need to pay careful attention to this form of wording in exam questions.

The correct answer is: rectangular.

Question 4

Correct

Mark 1.00 out of 1.00

On a Drag/TAS plot, the bottom of the total drag curve indicates _____.
On a Drag/IAS plot the bottom of the total drag curve indicates _____.

- VMD; VIMD ✓ Great job!
- VIMD; VIMD
- VMD; VMD
- VIMD; VMD

The correct answer is: VMD; VIMD

Question 5

Correct

Mark 1.00 out of 1.00

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

- x 4.0
- x 0.5
- x 2.0
- x 0.25 ✓ Great job!

The correct answer is: x 0.25

Question 6

Correct

Mark 1.00 out of 1.00

The outline shape of the wings when seen from above is called the wing _____.

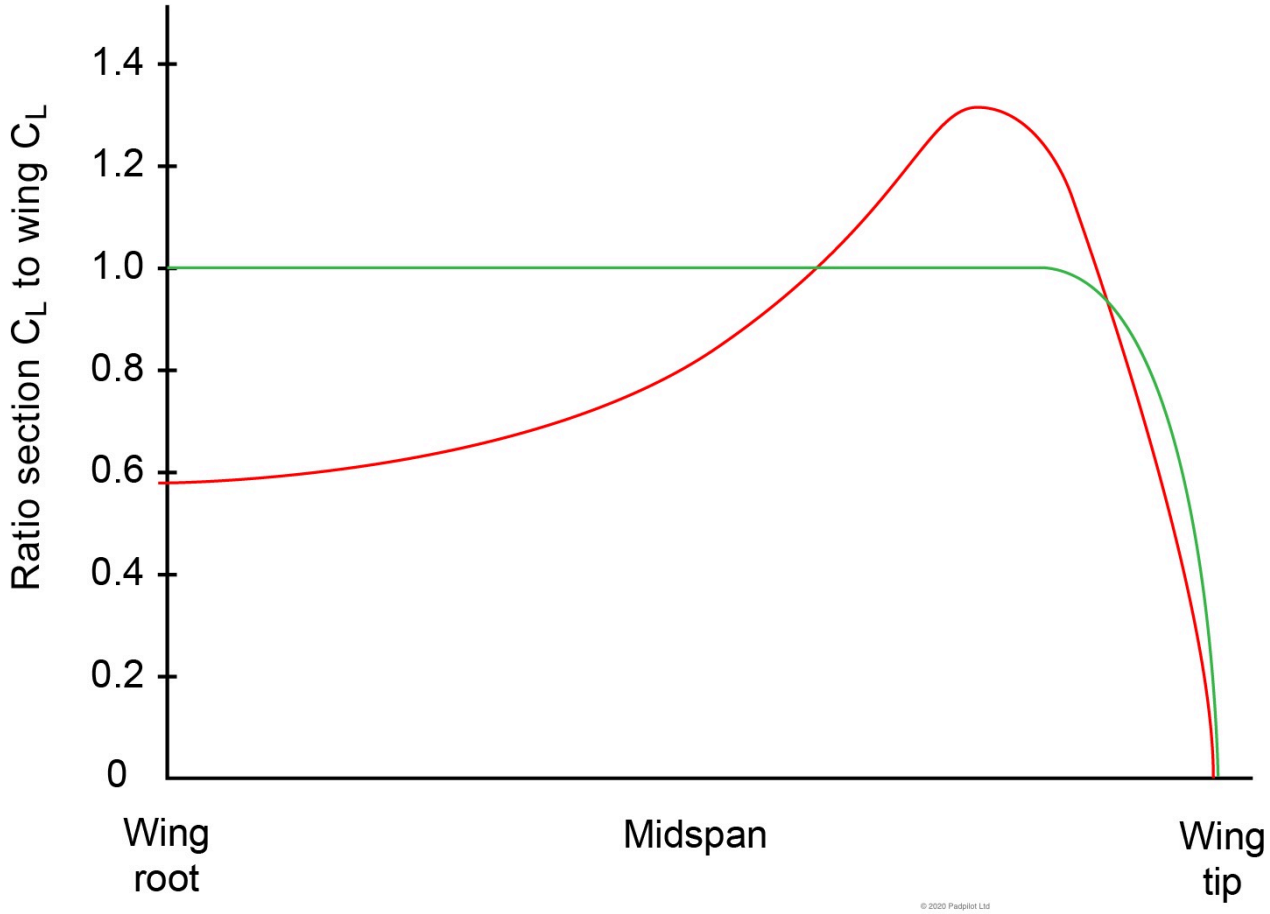
- aspect ratio
- planform ✓ Great job!
- camber

The correct answer is: planform

Question 7

Correct

Mark 1.00 out of 1.00



In these plots of spanwise lift distribution. Mark 2 correct answers.

- The green curve shows the lift distribution of a tapered rectangular, tapered wing.
- The red curve shows the lift distribution of a rectangular wing
- The green curve shows an elliptical CL distribution. ✓
- The red curve shows the CL distribution of a swept, tapered wing. ✓

The correct answers are: The red curve shows the CL distribution of a swept, tapered wing., The green curve shows an elliptical CL distribution.

Question 8

Correct

Mark 1.00 out of 1.00

A general purpose aerofoil is most efficient (best L/D ratio) at about _____ alpha.

- 4° ✓ Great job!
- 16°
- 6°
- 2°

The correct answer is: 4°

Question 9

Correct

Mark 1.00 out of 1.00

Comparing the lift coefficient and drag coefficient for conventional aeroplanes:

- CL is lower than CD.
- CL is much greater than CD. ✓ Great job!
- CL is much lower than CD.
- CL has approximately the same value as CD.

The correct answer is: CL is much greater than CD.

Question 10

Correct

Mark 1.00 out of 1.00

The ideal pattern for the span wise distribution of lift is one where the majority of the lift is produced inboard. This can be produced by _____ wing planform.

- rectangular
- an elliptical ✓ Great job!

The correct answer is: an elliptical

Question 11

Correct

Mark 1.00 out of 1.00

On take-off, tip vortices start to be produced _____.

- when the aircraft rotates ✓ Great job!
- when the aircraft begins its take-off roll

The correct answer is: when the aircraft rotates

Question 12

Incorrect

Mark 0.00 out of 1.00

A swept wing _____ downwash at the wing tips.

- has no effect on.
- decreases.
- increases. ✗ Not quite. Please review the lesson contents.

The correct answer is: decreases.

Question 13

Correct

Mark 1.00 out of 1.00

Tip vortices _____ with an increase in alpha.

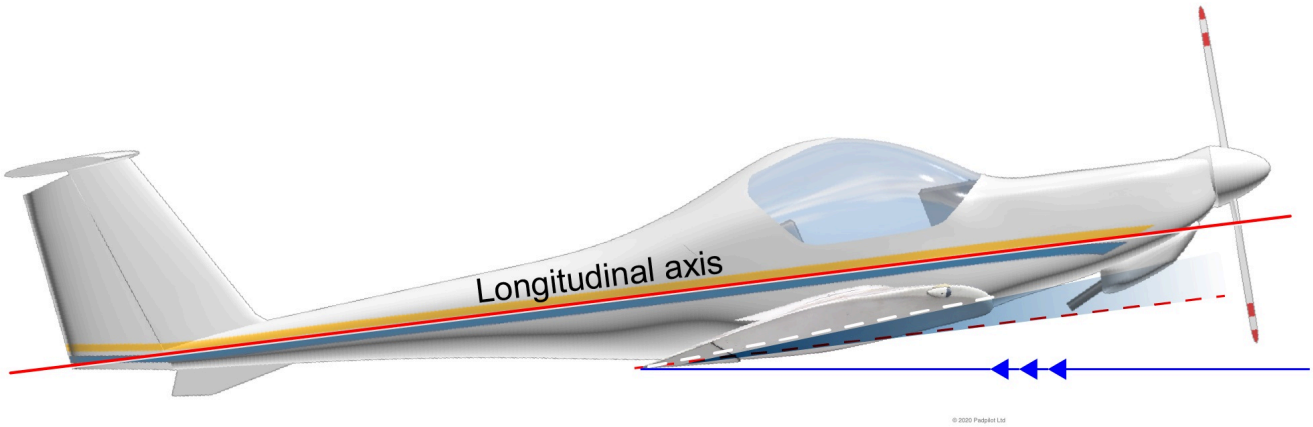
- increase. ✓ Great job!
- decrease.
- do not change.

The correct answer is: increase.

Question 14

Correct

Mark 1.00 out of 1.00



The angle shaded in blue in this diagram is the:

- Angle of attack.
- Angle of incidence. ✓ Great job!

The correct answer is: Angle of incidence.

Question 15

Correct

Mark 1.00 out of 1.00

Parasite drag increases with _____.

- V^2 ✓ Great job!
- alpha
- V

The correct answer is: V^2

Question 16

Correct

Mark 1.00 out of 1.00

_____ forces in the boundary layer are the primary cause of skin friction drag.

- Momentum
- Shear ✓ Great job!

The correct answer is: Shear

Question 17

Correct

Mark 1.00 out of 1.00

Which of the following are valid measures to reduce induced drag: Mark 3 correct answers.

- [x] High aspect ratio
- [ ] Low aspect ratio
- [x] Wing twist
- [x] Winglets
- [ ] Increasing camber towards the wing tips

The correct answers are: Wing twist, High aspect ratio, Winglets

Question 18

Correct

Mark 1.00 out of 1.00

The angle of incidence _____. The angle of attack _____.

- changes; changes.
- is fixed; is fixed.
- is fixed; changes. Great job!
- changes; is fixed.

The correct answer is: is fixed; changes.

Question 19

Correct

Mark 1.00 out of 1.00

Aspect ratio is the ratio of wingspan to average wing _____.

- thickness
- length
- chord Great job!

The correct answer is: chord

Question 20

Correct

Mark 1.00 out of 1.00

Increasing dynamic pressure will have the following effect on the total drag of an aeroplane:

- at speeds below the minimum drag speed, total drag increases.
- at speeds above the minimum drag speed, total drag increases. ✓ Great job!
- total drag increases across the whole speed range.
- total drag decreases across the whole speed range.

The correct answer is: at speeds above the minimum drag speed, total drag increases.

Question 21

Incorrect

Mark 0.00 out of 1.00

From a polar curve of the entire aeroplane one can read:

- the minimum CL/CD ratio and the minimum drag.
- the minimum drag and the maximum lift.
- the minimum drag coefficient and the maximum lift. ✗ Not quite. Please review the lesson contents.
- the maximum CL/CD ratio and maximum lift coefficient.

The correct answer is: the maximum CL/CD ratio and maximum lift coefficient.

Question 22

Correct

Mark 1.00 out of 1.00

The main factors affecting skin friction drag are:

- Airspeed, frontal area and boundary layer conditions.
- Alpha, surface area and boundary layer conditions.
- Airspeed, surface area and boundary layer conditions. ✓ Great job!
- Surface area, boundary layer conditions and tip vortices.

The correct answer is: Airspeed, surface area and boundary layer conditions.

Question 23

Correct

Mark 1.00 out of 1.00

High aspect ratio wings produce _____ tip trailing vortices and are therefore inherently _____ efficient than low aspect ratio wings.

- weaker; more. ✓ Great job!
- stronger; less.
- stronger; more.
- weaker; less.

The correct answer is: weaker; more.

Question 24

Incorrect

Mark 0.00 out of 1.00

If you are flying at 1.4 VS and accelerate to 2.4 VS, by how much will the coefficient of lift decrease by?

- 0.66
- 0.42
- 0.58
- 0.34 ✗ Not quite. Please review the lesson contents.

The lift is constant in both equations:
Lift = CL x (½ ρ x 1.4 VS^2) x S

Lift = 1.4 VS^2

Lift = CL x (½ ρ x 2.4 VS2) x S

1.4 VS^2 = CL x 2.4 VS^2

CL = 1.4 VS^2 ÷ 2.4 VS^2

CL = 0.34

Therefore, CL has reduced from 1 in the equation for 1.4 VS^2 to 0.34 in the equation for 2.4 VS^2

Reduction in CL = 1 - 0.34

Reduction in CL = 0.66

The correct answer is: 0.66

Question 25

Correct

Mark 1.00 out of 1.00

The main factors affecting profile drag are:

- Angle of attack, frontal area, shape and streamlining, surface roughness.
- Airspeed, angle of attack, surface area, streamlining, frontal area.
- Frontal area, wing planform shape, surface roughness.
- Airspeed, frontal area, shape and streamlining, surface roughness. ✓ Great job!

The correct answer is: Airspeed, frontal area, shape and streamlining, surface roughness.

Question 26

Correct

Mark 1.00 out of 1.00

When viewed from behind, tip vortices rotate _____ the aircraft.

- towards. ✓ Great job!
- away from.

The correct answer is: towards.

Question 27

Correct

Mark 1.00 out of 1.00

Which of the following statements about induced drag is most correct.

- Induced drag increases with air speed.
- Induced drag is the result of the lift vector being tipped backwards because of the change in the angle of incidence.
- Induced drag is the result of the lift vector being tipped backwards because the effective angle of attack is greater than the angle of attack.
- Induced drag reduces with an increase in aircraft mass.
- Induced drag is the result of the lift vector being tipped backwards owing to the change in the angle of the free stream air flow. ✓ Great job!

The correct answer is: Induced drag is the result of the lift vector being tipped backwards owing to the change in the angle of the free stream air flow.

Question 28

Correct

Mark 1.00 out of 1.00

Which of the following statements is most accurate.

- An elliptical lift distribution minimises tip vortices and thus minimises parasite drag.
- Tip vortices are stronger with lower wing loading.
- Biasing the spanwise lift distribution to maximise lift inboard reduces drag. ✓ Great job!
- Tip vortices increase downwash but have little effect on drag.

The correct answer is: Biasing the spanwise lift distribution to maximise lift inboard reduces drag.

Question 29

Correct

Mark 1.00 out of 1.00

Which of the following statements is/are correct?

- [x] Induced drag increases with aircraft mass. ✓
- [x] Induced drag is caused by vortices with occur only when lift is being created. ✓
- [x] Induced drag increases when the aircraft is manoeuvred at positive g. ✓
- [ ] Induced drag is caused by tip vortices which occur at any positive forward speed.
- [ ] Induced drag increases with speed in level flight.

The correct answers are: Induced drag increases when the aircraft is manoeuvred at positive g., Induced drag increases with aircraft mass., Induced drag is caused by vortices with occur only when lift is being created.

Question 30

Correct

Mark 1.00 out of 1.00

CDI is _____ proportional to aspect ratio and _____ proportional to the CL^2.

- directly; inversely.
- directly; directly.
- inversely; inversely.
- inversely; directly. ✓ Great job!

The correct answer is: inversely; directly.