Unit 10 - Week 8

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-11-11, 23:59 IST.

1) What is the most compelling reason to try and maintain Laminar flow on a wing? *1 point*

- Laminar flow is less resistant to separation compared to Turbulent flow
- Skin Friction Drag in Laminar flow is much lower than that in Turbulent flow
- Form Drag in Laminar flow is much lower than that in Turbulent flow
- Laminar flow results in much higher Lift Coefficient, hence a smaller wing area

No, the answer is incorrect.
Score: 0
Accepted Answers:
Skin Friction Drag in Laminar flow is much lower than that in Turbulent flow

2) Data of an aircraft is as follows: S = 25 m^2 , AR = 8, Taper ratio = 0.6, Angle of Incidence of Wing = 2 deg, Airfoil Section: NACA 63-209, (Zero Lift Angle of Attack = -1.5 deg), Lift Curve Slope = 6.3 /rad, and wing efficiency factor e = 1.

If the aircraft is flying at an altitude of 5000 m, with a speed of 330 kmph under ISA conditions, estimate the Lift produced (in N).

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 22000,25000

2 points

3) Which of the following result(s) in the largest increase in stalling angle? *1 point*

- Split flap
- Flower flap
- Plain flap
- Leading edge flap

No, the answer is incorrect.
Score: 0
Accepted Answers:
Split flap

4) Which of the following are components of subsonic parasite drag? *1 point*

- Skin Friction Drag
- Form Drag
- Interference Drag
- Induced Drag

No, the answer is incorrect.
Score: 0
Accepted Answers:
Skin Friction Drag
Form Drag
Interference Drag

5) For the wing of a jet General Aviation Aircraft with the following characteristics,

Maximum Takeoff Mass, M_{To}	4000 kg
Wing Planform Area, S	30 m^2
Cruise Velocity at 3000 m	463 kmph
Stall Velocity	120 kmph

The high lift device (split flap) will provide $\Delta C_L = 0.9$ when deflected.

Calculate the Maximum Lift Coefficient of wing without high lift devices.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.6,1.8

1 point

6) The wing efficiency factor, e depends upon *1 point*

- Aspect Ratio
- Wing Sweep
- Wing Taper Ratio
- Wing Dihedral Angle

No, the answer is incorrect.
Score: 0
Accepted Answers:
Aspect Ratio
Wing Sweep
Wing Taper Ratio

7) For a twin engine general aviation aircraft Wing Planform Area, S_{ref} = 30 m^2 , the Wetted Surface Area, S_{wet} = 65 m^2 . The Zero-Lift Drag coefficient is _____ x 10^{-3}

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 9.5,10.00

1 point

8) The light airplane starts its cruise segment at 82 m/s at 3,000 m when it weighs 1450 kg. After cruising for a period of time at that altitude it is noticed it now weighs 1370 kg. Using a wing area of S = 13.47 m^2 compute the final airspeed in (m/s) if the pilot maintains a constant lift coefficient.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 78,82

2 points