

Unit 8 - Week 6

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

● Lecture 26: Turbulent Boundary Layers (Contd.)

● Lecture 27: Turbulent Boundary Layers (Contd.)

● Lecture 28: Drag

● Lecture 29: Drag (Contd.)

● Lecture 30: Heat Transfer Basics

○ Quiz : Assignment 6

○ Week 6 Feedback Form

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Text Transcripts

Assignment Detailed Solution

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Live Interactive Session

Assignment 6

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

Due on 2020-03-11, 23:59 IST.

1) State True or False:
During flight, aircraft mostly experiences friction drag. 1 point

- a. True
 b. False

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. True

2) Water flows over a flat plate at a speed of 1m/s. The plate is 0.4m long and 1m wide. The boundary layer on each surface of the plate is laminar. Assume that the velocity profile may be approximated as linear, Given: $\nu_{\text{water}} = 8.9 \times 10^{-4} \text{ m}^2/\text{s}$, $\rho_{\text{water}} = 1000 \text{ kg/m}^3$. Determine the drag co-efficient 1 point

- a. 0.063
b. 0.5
c. 0.072
d. 0.9

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0

Accepted Answers:
a

3) Determine the drag force acting on the plate in **Q:2** 1 point

- a. 31.22
 b. 62.64
 c. 77.89
 d. 102.83

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. 62.64

4) The lift force on an aerofoil with a lift co-efficient C_L in a fluid with density ρ and velocity U is given by 1 point

- a. $C_L \rho U A$
b. $1/2 C_L^2 \rho U A$
c. $1/2 C_L \rho U^2 A$
d. $C_L \rho U^2 A$

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

5) Which of these modes of heat transfer requires no medium for energy transport? 1 point

- a. Conduction
 b. Convection
 c. Radiation
 d. Advection

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. Radiation

6) Heat is getting transferred by a chain of static molecules from the hot area of an object to a colder area. Choose the correct mode of heat transfer. 1 point

- a. conduction
 b. Natural convection
 c. Radiation
 d. Forced convection

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. conduction

7) Heat transfer by conduction is directly proportional to which of the following? 1 point

- a. (thermal resistance) / (thermal potential difference)
 b. (thermal potential difference) / (thermal resistance)
 c. thermal resistance
 d. (thermal potential difference) * (thermal resistance)

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. (thermal potential difference) / (thermal resistance)

8) A cricket bowler bowls can use the seam of the ball to create (choose the correct one) 1 point

- a. Turbulent on both the sides
 b. Laminar on both the sides
 c. Laminar on one side, turbulent on another side
 d. None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. Laminar on one side, turbulent on another side

9) If k_s , k_l , k_g are thermal conductivities of aluminium, water and air at the same temperature, then which of the following is true ? 1 point

- a. $k_g > k_l > k_s$
b. $k_l > k_g > k_s$
c. $k_s > k_g > k_l$
d. $k_s > k_l > k_g$

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0

Accepted Answers:
d

10) When crude oil is pumped through a furnace, heat transfer to the tubes occurs when the hot flue gases rise and heat the tubes. The tubes are heated principally by the process of 1 point

- a. conduction
 b. convection
 c. radiation
 d. condensation

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. convection