

Unit 2 - Week 0

Course outline
How does an NPTEL online course work?
Week 0
Quiz : Assignment 0
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Text Transcripts
Assignment Detailed Solution
DOWNLOAD VIDEOS
Live Interactive Session

Assignment 0

The due date for submitting this assignment has passed. **Due on 2020-01-27, 23:59 IST.**
 As per our records you have not submitted this assignment.

- Which one of the following is the dimension of specific volume of a liquid?
 - a) $[M^{-1} L^{-3} T^0]$
 - b) $[M^{-1} L^{-3} T^0]$
 - c) $[M^{-1} L^{-3} T^0]$
 - d) $[M^0 L^3 T^0]$

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b
- Which of the following is NOT generally considered in the Navier-Stokes equation?
 - a) Gravity force
 - b) Pressure force
 - c) Surface tension force
 - d) Viscous force

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c
- Which of the following equations is a result of momentum conservation for inviscid flows?
 - a) Bernoulli's equation
 - b) Navier-Stokes equation
 - c) First law of thermodynamics
 - d) Euler's equation

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: d
- The equation of continuity is based on the principle of
 - a) conservation of mass
 - b) conservation of momentum
 - c) conservation of energy
 - d) conservation of force

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- The flow of a liquid through a circular pipe is in the laminar zone. Now, the fluid through the pipe is replaced with a more viscous fluid and passed through the pipe again with the same velocity. What can we say about the nature of this flow?
 - a) The flow will become turbulent
 - b) The flow will be a transition flow
 - c) The flow will remain laminar
 - d) Insufficient data to define

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c
- Assuming a developing flow of a fluid on a flat plate in turbulent condition, a very thin region near the plate surface is commonly known as
 - a. laminar buffer layer
 - b. laminar sublayer
 - c. laminar turbulent layer
 - d. none of the above

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b
- Consider the following statements:
 The Fourier heat conduction equation $Q = -k A dT/dx$
 Where, k is the thermal conductivity and A is the cross sectional area of the material, presumes
 - i) Steady state conditions
 - ii) Constant vapour temperature
 - iii) Uniform temperature at the wall surface
 - iv) One dimensional heat flow
 Which of these statements are correct?
 - a) i, ii and iii
 - b) i, ii and iv
 - c) ii, iii and iv
 - d) i, iii and iv

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: d
- Which one of the following forms of water have the highest value of thermal conductivity?
 - a) Boiling water
 - b) Steam
 - c) Solid ice
 - d) Melting ice

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c
- Three metal walls of the same thickness and cross sectional area have thermal conductivities k, 2k and 3k respectively and are connected in series. The temperature drop across the walls (for same heat transfer) will be in the ratio
 - a) 1:0.5:0.33
 - b) 0.35:0.45:0.55
 - c) 0.33:0.569:0.458
 - d) Given data is insufficient

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- Which of the following is not correct in a transient flow process?
 - a) The state of matter inside the control volume may vary with time
 - b) There can be work and heat interactions across the control volume
 - c) There is no accumulation of matter inside the control volume
 - d) The rate of inflow and outflow of mass may be different

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: c
- Which of the following dimensionless number gives an indication of the ratio of internal (conduction) resistance to the surface (convective) resistance?
 - a) Biot number
 - b) Fourier number
 - c) Stanton number
 - d) Nusselt number

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- The boundary layer thickness is taken to be at a distance from the plate surface to a point at which the velocity is given by: (where U_∞ is the free stream velocity)
 - a) $u = 0.99 U_\infty$
 - b) $u = 0.75 U_\infty$
 - c) $u = 0.50 U_\infty$
 - d) $u = 0.33 U_\infty$

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- The relationship between the thermal and hydrodynamic boundary layer thickness is governed by the
 - a) Peclet number
 - b) Prandtl number
 - c) Stanton number
 - d) Fourier number

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b
- Which among the following is the statement of the 'Fick's Law'?
 - a) The molar flux of species relative to an observer moving with the molar average velocity is proportional to the concentration gradient of the species.
 - b) The mass flux of species relative to an observer moving with the molar average velocity is proportional to the concentration gradient of the species.
 - c) The molar flux of species relative to an observer moving with the mass average velocity is proportional to the concentration gradient of the species.
 - d) The molar flux of species relative to a stationary observer is proportional to the concentration gradient of the species.

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- Which among the following is always true for mass transfer to occur?
 - a) Difference in concentration
 - b) Difference in Pressure
 - c) Difference in temperature
 - d) Difference in chemical potential

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: d
- For an incompressible fluid flow, if area reduces, then the velocity will
 - a) increase
 - b) decrease
 - c) first increase then decrease
 - d) first decrease then increase

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- Some of the unique features of physisorption are:
 - i. It occurs at low temperatures
 - ii. It is an irreversible process
 - iii. It occurs primarily due to van der Waals forces
 - iv. Involves high heat of adsorption (in the range of 80-240 kJ/mol)
 - a) i only
 - b) i and iii only
 - c) i, iii and iv only
 - d) iv only

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: b
- The relationship between Darcy friction factor (C) and fanning friction factor (f) is:
 - a. $C = 4f$
 - b. $f = 4C$
 - c. $C = f$
 - d. None of the above

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- The statement "The total amount of radiation emitted by a body per unit area, per unit time" is the definition of which of the following:
 - a. Total emissive power
 - b. Non-emissive range
 - c. Black body optics
 - d. None of the above

a
 b
 c
 d

No, the answer is incorrect.
 Score: 0
 Accepted Answers: a
- Consider a fluid moving over a stationary flat plate, then the velocity of the fluid at the fluid-solid interface is equal to the velocity of the solid. This is used as a boundary condition in fluid flow and is commonly known as
 - a. Navier-slip
 - b. Boltzmann-slip
 - c. No-slip
 - d. Euler slip

a
 b
 c
 d

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