



Quiz Questions

Forced Convection in External Flows

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1. In a computer, the cooling of electronic components by forcing air over them using a fan is an example of _____ heat transfer

- a) Forced convection
- b) Natural convection
- c) Radiation
- d) Conduction

2. The ratio of convective to conductive heat transfer between a solid and fluid is generally referred to as the _____

- a) Prandtl number
- b) Reynold's number
- c) Nusselt number
- d) Rayleigh's number

3. For the case of forced convection, experiments show that Nusselt number is a function of _____ and _____

- a) Prandtl number and Rayleigh's number
- b) Prandtl number and Reynold's number
- c) Reynold's number and Rayleigh's number
- d) None of the above

4. For gases, which of the following is true?

- a) $Pr \approx 1$
- b) $Pr \gg 1$
- c) $Pr \ll 1$
- d) $Pr = 0$

5. For liquid metals ($Pr \ll 1$), the velocity boundary layer is _____ the thermal boundary layer.

- a) Thicker than
- b) Thinner than
- c) Equal to
- d) None of the above

6. According to Reynold's analogy, which of the following is true?

- a) $0.5 \nu (C_f) Re_L = Nu$
- b) $0.5 C_f Re_L = Nu^2$
- c) $0.5 C_f^2 Re_L = Nu$
- d) $0.5 C_f Re_L = Nu$

7. In a laminar flow over a flat plate, the average Nusselt number is _____ the local Nusselt number.
- a) Thrice
 - b) Half
 - c) Twice
 - d) None of the above
8. In laminar flows, for any fluid with $Pr > 0.6$, the ratio of hydrodynamic to thermal boundary layer (δ/δ_t) is approximately equal to _____.
- a) Pr^2
 - b) $Pr^{(1/3)}$
 - c) Pr^3
 - d) $Pr^{(1/2)}$
9. In turbulent flows, the hydrodynamic boundary layer thickness is _____ the thermal boundary layer thickness.
- a) Greater than
 - b) Approximately equal to
 - c) Less than
 - d) None of the above
10. In the case of a laminar flow over a cylinder, the heat transfer coefficient _____ from the stagnation point to the separation point.
- a) Remains the same
 - b) Increases
 - c) Decreases
 - d) Insufficient information

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