Roll No. | | | | | | | | | | | | |

Total No. of Pages: 02
Total No. of Questions: 09

B.Tech (Sem.-5th)

HEAT TRANSFER

Subject Code: BTAE-503
Paper ID: [A2063]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:

1. Section –A, is Compulsory.
2. Attempt any four questions from Section-B.
3. Attempt any two questions from Section-C.

Section –A (10x2=20)

Q.1.

(a) What is the significance of heat transfer ?
(b) Define thermal diffusinity.
(c) What is meant by efficiency of firs?
(d) What is the function of heat exchanger ?
(e) Define transmissivity.
(f) What is meant by free connection?
(g) What do you understand by black body?
(h) What is a turbulent flow?
(i) Define heat exchanger effectiveness.
(j) What do you understand by counter flow heat exchanger?

Section –B (4x5=20)

Q.2. Differentiate between natural and forced connection.

Q.3. Discuss the effect of temperature and pressure on thermal conductivity of solid.

Q.4. Enumerate the factors on which the rate of emission of radiation by a body depend.

Q.5. Derive expression for temperature distribution and heat dissipation in a straight fin of rectangular profile for fin losing heat at the tip.

Q.6. Calculate the rate of heat transfer per unit area through a copper plate 45mm thick whose are face in maintained at 350^0C and the other face at 50^0C .Take thermal conductivity of copper as 370 w/m^{0}C

Section –C (10x2=20)

Q.7. Derive expressions for temperature distribution under one dimensional steady state heat conduction for a plane wall.

Q.8. Briefly write a note on temperature distribution and thermal stresses in piston.

Q.9. Water is heated while flowing through a 15mm x35mm rectangular cross-section tube at a velocity of 1.2 m/s .The water enters at 40^0c and tube wall is maintained at 85^0c Determine the length of the tube required to raise the temperature of water by 30^0c.Take the following properties of water :

P=985.5 kg/m^3, K=0.653 w/m^0c

V=0.517 x 10^{-6} m^2/s , G= 4.19 KJ/kg^{0}c

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