Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

ME-6003 (CBGS)

B.E. VI Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Heat and Mass Transfer

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Suitable missing misprint data , if any.

1. a) What is thermal resistance.
   b) Express the thermal resistance for conductive for a hollow cylinder in terms of inner and outer radii.

2. A domestic oven has a composite wall formed by 0.5cm thick chrome-mickel (k = 19 W/mk) sheet supported by 1cm thick asbestos (k = 0.1105 W/mk) sheet. In steady state operation the hot gases inside the oven are at 350°C while atmospheric air in at 30°C. The convective heat transfer coefficient at inside and outside surface of the oven are 100 W/m^{2}k and 15 W/m^{2}k respectively. Determine the rate of heat losses per unit area through the oven wall.

3. a) What is an Extended surface? Name three applications of it.
   b) Define Fin efficiency and fin effectiveness.

4. a) Distinguish between natural and forced convection.
   b) What is Grashof number and Rayleigh number? Discuss their significance.

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5. A horizontal rod of 5cm diameter is maintained at a constant temperature of 70°C by submerging it in water of 20°C. Calculate the heat loss by fee convection per unit length of rod.

6. Define LMTD and derive it's expression for parallel flow heat exchanger.

7. a) What is Thermal radiation? State the governing heat transfer law of radiation.
   b) Explain the different regimes of boiling.

8. Write short notes on any two
   a) Critical thickness
   b) Fick's law of mass transfer
   c) Black and Gray surfaces
   d) Filmwise condensation

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