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Roll No .....

AU-702(B)-CBGS

B.Tech., VII Semester

Examination, December 2020

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.

1. a) Write down the significance of Reynold's and Nusselt number? 7
   b) What is a radiation shield? 7

2. a) What is intensity of radiation? 7
   b) What are the use of heat pipe? 7

3. a) Counter flow heat exchanger most preferred why? 7
   b) Give the classification of heat exchangers. 7

4. a) Define effectiveness of a heat exchanger. Derive an expression for the effectiveness of a double pipe parallel flow heat exchanger. State the assumptions made. 7
   b) A parallel flow heat exchanger has hot and cold water stream running through it, the flow rates are 10 and 25 kg/min respectively. Inlet temperatures are 75° C and 25° C on hot and cold sides. The exit temperature on the hot side should not exceed 50° C. Assume $h_i = h_o = 600 W/m^2K$. Calculate the area of heat exchanger using E-NTU approach. 7

5. a) Define emissivity, absorptivity and reflectivity. 7

   b) Describe the phenomenon of radiation from real surfaces. 7

6. a) State and prove the Kirchhoff's law of radiation. 7

   b) State and prove the Stefan - Boltzmann law. 7

7. List the dimensionless numbers. Explain any two in detail. 14

8. a) What is Fourier's Law of heat conduction? Explain with suitable example 7

   b) What is Newtonian heating or cooling process? 7

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