Reg. No. :

Question Paper Code: 55903

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Chemical Engineering

15UCH503-HEAT TRANSFER

(Use of HMT data book is permitted)

(Regulation 2015)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The amount of heat required to raise the temperature of a substance by 1°C is called as   CO1- R

    (a) Work capacity   (b) Energy capacity   (c) Heat capacity   (d) None of the above

2. Heat transfer in liquid and gases takes place by   CO1- R

    (a) conduction   (b) convection   (c) radiation   (d) scattering

3. Maximum heat transfer rate is achieved in _____ flow   CO2- R

    (a) co-current   (b) laminar   (c) counter-current   (d) turbulent

4. What is the dimension of kinematic viscosity?   CO2- U

    (a) $M L^2 T^{-2}$ (b) $L^2 T^{-2}$ (c) $L^2 T^{-1}$ (d) $M L^2 T^{-1}$

5. Thermal radiation takes place from a body by electromagnetic waves as a result of   CO3- R

    (a) the weight of the body   (b) the magnetic power of the body   (c) the temperature of the body   (d) none of the above

6. Which one is a perfect black body among the following?   CO3- R

    (a) Stars   (b) Wood   (c) Aluminum   (d) A piece of paper

7. In which type of boiling the fluid motion is induced by external means   CO4- R

    (a) Pool   (b) Local   (c) Forced convection   (d) Sub cooled

8. The thermal resistance for heat transfer is low in   CO4- R

(a) drop-wise condensation   (b) film condensation

(c) both drop-wise and film condensation   (d) unpredictable

9. Heat exchangers are classified into how many categories?   CO5- U

    (a) 1   (b) 2   (c) 3   (d) 4

10. Which of the following is/are example/s of direct contact type heat   CO5- U
    exchanger?

    (a) jet condenser   (b) desuperheater

    (c) cooling tower   (d) all of the above

<div align="center">PART – B (3 x 8= 24 Marks)</div>

<div align="center">(Answer any three of the following questions)</div>

16. Derive the equation for heat transfer by conduction through a hollow   CO1- U   (8)
    cylinder and draw the temperature profile

17. What is Wilson plot and write its importance in calculating film heat   CO2- U   (8)
    transfer coefficients.

18. What is radiation shape factor? And derive an expression for it.   CO3- U   (8)

19. Discuss briefly about the feed arrangement in multiple effect   CO4- U   (8)
    evaporator with suitable diagram

20. Discuss briefly about shell and tube heat exchangers and its   CO5- U   (8)
    arrangement with a neat sketch.

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