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17065-CH-014

BOARD DIPLOMA EXAMINATION
MARCH/APRIL - 2019
DIPLOMA IN CHEMICAL ENGINEERING
HEAT TRANSFER
FOURTH SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Define and explain thermal conductivity of a substance and write its units
2. Estimate the heat loss per m^2 of the surface through a brick wall of 0.5 m thick when the inner surface is at 400°k and the outside surface is at 310°k, the thermal conductivity of the brick may be taken as 0.7 w/m.°k
3. Define the film heat transfer coefficient
4. Define overall heat transfer coefficient
5. Define Gratez number
6. What is meant by Black body?
7. Define the View factor
8. Give the classification of shell and tube heat exchangers
9. Define the terms Economy and Capacity of an evaporator
10. Write common examples of evaporation

PART - B (10m x 5 = 50m)

Note 1:Answer any five questions and each carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. Derive an expression to calculate the rate of heat transfer through a plane wall
12. The hot fluid enters a double pipe heat exchanger at a temperature of 150°C and is to be cooled to 94°c by a cold fluid entering at 38°c and heated to 66°c.calculate LMTD
13. Explain enthalpy balance in condenser
14. Explain the heat transfer by forced convection in laminar flow

15. Explain the function of Calendria with a neat diagram

16A. Calculate the loss of heat by radiation from a steel tube of diameter 70mm and 3 m long at a temperature of 227°c, if the tube is located in a square brick conduit 0.3m side at 27°c. Assume emissivity for steel as 0.79 and for brick conduit as 0.93

B. Differentiate between single pass and multi pass shell and tube heat exchangers

17. Compare and explain about forward feed and backward feed arrangements in multiple effect evaporator

18. Explain about various evaporator accessories

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