Code No: D5104 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
ADVANCED CHEMICAL ENGINEERING PLANT DESIGN
(CHEMICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks
- - -

1. The temperature of oil leaving a co-current flow cooler is to be reduced from 370 to 350 K by lengthening the cooler. The oil & water flow rates & inlet temperatures and other dimensions of the cooler remain constant. The water enters at 285 K & the oil at 420K.The water leaves the original cooler at 310 K. If the original length is one metre, what must be the new length?

2. What is multiple effect evaporation? Discuss about the methods of feeding in multiple effect evaporators.

3. How do you classify vaporizing exchangers? Explain about forced circulation vaporizing exchangers.

4. A packed tower is designed to recover 98% CO_2 from a gas mixture containing 10% CO_2 & 90% air using water. A relation y =14x can be used for equilibrium conditions, where y is kg CO_2/ kg dry air and x is kg CO_2/ kg dry water. The water to gas rate is kept 30% more than the minimum value. Calculate the height of the tower if $(HTU)_{OG}$= 1m.

5. Discuss the design of valve trays.

6. Discuss the classification of heat exchangers. Explain the mechanical design of shell & tube heat exchanger.

7. Discuss the practical thumb rules involved in design of fractionating towers.

8. What do you mean by scale-up of equipment? Discuss the basic principles involved in scale-up of any equipment.

******