

Question Paper Code: 56901A

B.E./B.Tech. DEGREE EXAMINATION, AUGUST 2021

Sixth Semester

Chemical Engineering

15UCH601 - MASS TRANSFER - II

(Regulation 2015)

PART – A (10 X 2 =20 Marks)
ANSWER ANY TEN QUESTIONS

- | | | |
|--|-----------|------------|
| 1. Distinguish between Raoult's law and Henry's law | AN | CO1 |
| 2. Write any two examples for industrial absorption process. | R | CO1 |
| 3. Draw the T-x,y diagram for constant pressure system | R | CO2 |
| 4. Explain the term total reflux. | U | CO2 |
| 5. Demonstrate plait point in extraction. | AP | CO3 |
| 6. Mention the applications of liquid-liquid extraction. | R | CO3 |
| 7. Explain the term Insitu leaching. | U | CO4 |
| 8. What is heap leaching? | U | CO4 |
| 9. What is elution? | R | CO5 |
| 10. Mention some applications of adsorption. | R | CO5 |
| 11. State Raoult's Law | U | CO1 |
| 12. What is steam distillation? | R | CO2 |
| 13. What is stage efficiency? | R | CO3 |
| 14. Explain the principle of leaching. | U | CO4 |
| 15. What is physical adsorption? | R | CO5 |

PART - B (10 X 3 =30 Marks)

ANSWER ANY THREE QUESTIONS

- 1 A gas absorber is to be designed to handle 900 m³/hr of coal gas containing 2% by volume of benzene. Coal gas enters the tower with temperature of 300 K and 805 mm Hg and 95% of benzene is to be recovered by solvent. The solvent enters the tower at 300K and has 0.005 mole fraction of benzene and average molecular weight of 260. Calculate the circulation rate of solvent per seconds if to be operating 1.5 times of minimum solvent rate. The equilibrium relationship is $y = 0.125 x$ **AP CO1**
- 2 Derive an equation for operation line for enriching and stripping section and to determine the number of stages using McCabe Thiele method. **AP CO2**
- 3 Nicotine in a water solution containing 1 % nicotine is to be extracted once with kerosene at 20°C. Kerosene and water are insoluble. Determine the % extraction if 1000 kg of feed solution is extracted once with 1500 kg solvent. What will be the extraction if three ideal stages used with 500 kg of solvent in each stage? **AP CO3**
- Equilibrium data:
- | | | | | | | | |
|---|---|---------|----------|---------|---------|---------|--------|
| x | 0 | 0.00101 | 0.00246 | 0.00502 | 0.00751 | 0.00998 | 0.0204 |
| y | 0 | 0.0081 | 0.001962 | 0.00456 | 0.00686 | 0.00913 | 0.0187 |
- 4 Explain the principle, construction and working of Rotocel extractor. **U CO4**
- 5 Justify that for cross current two-stage treatment of liquid solution by contact filtration, when the adsorption isotherm is linear, the least total adsorbent results if the amounts used in each stage are equal. **R CO5**