



C09-CH-406/C09-PET-404

3437

BOARD DIPLOMA EXAMINATION, (C-09)  
MARCH/APRIL—2017  
DCHE—FOURTH SEMESTER EXAMINATION  
MASS TRANSFER

Time : 3 hours ]

[ Total Marks : 80

PART—A

3×10=30

**Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Differentiate between molecular and eddy diffusions.
2. What is meant by minimum reflux ratio?
3. State McCabe-Thiele assumptions.
4. Write about channelling.
5. State the various types of adsorptions.
6. Define extraction and leaching operations with an example.
7. Define wet-bulb and dry-bulb temperatures.
8. What do you understand by electro dialysis?

/3437

\* 1

[ Contd...

9. What are the various methods of attaining supersaturation?
10. Define the terms 'free moisture' and 'equilibrium moisture'.

**PART—B**

10×5=50

**Instructions :** (1) Answer any five questions.  
(2) Each question carries ten marks.  
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Oxygen (A) is diffusing through carbon monoxide (B) under steady-state conditions with the carbon monoxide non-diffusing. The total pressure is  $1 \times 10^5 \text{ N/m}^2$  and the temperature  $0^\circ \text{C}$ . The partial pressures of  $\text{O}_2$  at two planes 2 mm apart are  $13000 \text{ N/m}^2$  and  $6500 \text{ N/m}^2$  respectively.  $D_{AB} = 1.87 \times 10^{-5} \text{ m}^2/\text{s}$ . Calculate the rate of diffusion of  $\text{O}_2$  in  $\text{kmole/m}^2\text{s}$ .
12. (a) Write about minimum L/G ratio in absorption.  
(b) Explain about the number of stages in adsorption.
13. 1000 kmol/hr of ethanol-propanol mixture containing 65 mole% ethanol is to be separated in a continuous plate column operating at 1 atm. Total pressures to desired terminal compositions of ethanol are  $X_D = 0.92$ ,  $X_B = 0.07$ . The feed is a saturated vapor and total condenser is used. When the reflux ratio is 4 times the amount of top product, find the number of theoretical plates required if  $\alpha = 2.1$ .
14. Write short notes on the following :  
(a) Equilibrium distillation  
(b) HTU

/3437

- \* 15. (a) Describe any one of the crystallization equipments. 5  
(b) Write about the adiabatic saturation lines. 5
16. Explain the process of continuous distillation with rectification and stripping.
17. A certain material was dried under constant drying conditions and it was found that 2 hours are required to reduce the free moisture conc. from 20% to 10%. How much longer would be required to reduced the free moisture to 4%? Assume that no constant rate period is encountered.
18. (a) Explain about the mixer settler with a neat sketch. 5  
(b) Write about supersaturation. 5

\*\*\*