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C16-CH/PET-405

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BOARD DIPLOMA EXAMINATION, (C-16)
MARCH/APRIL—2018
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. Define mass transfer coefficient.
2. Distinguish between batch distillation and continuous distillation.
3. Define relative volatility and mention its significance.
4. Define adsorption.
5. What are random packings?
6. Apply phase rule to leaching operation.
7. Define saturation humidity.
8. What is dry bulb temperature?
9. How will the crystals grow in crystallization?
10. What are constant drying conditions?

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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°C . The partial pressure of O_2 at two planes 2 mm apart is 13000 N/m^2 and 6500 N/m^2 respectively. $D_{AB} = 1.87 \times 10^{-5} \text{ m}^2/\text{s}$. Calculate the rate of diffusion of O_2 in $\text{kmoles/m}^2\text{s}$.
12. Write in detail the concept of HTU in absorption operation.
13. Explain the working principle of a Bollmann extractor with a neat sketch.
14. Explain the method to determine the no. of stages for a binary mixture using McCabe-Thiele method.
15. (a) Write a short note on electrodialysis.
(b) Write about tower packings.
- * 16. A wet solid is to be dried from 35% to 10% moisture under constant drying conditions in five hours. If the equilibrium moisture content is 4% and the critical moisture content is 14%, how long it will take to dry solids to 6% moisture under the same conditions?
17. (a) Explain the equilibrium relationship in drying operation.
(b) Explain about forced draft cooling towers. 5+5=10
18. Explain the working of a Swenson Walker crystallizer with a neat sketch.

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