

*



3437

C09-CH-406/C09-PET-404

3437

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV-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. Define the mass transfer coefficient and give its equation.
2. Apply phase rule to distillation.
3. What is an azeotrope? Name different types of azeotropes.
4. What do you mean by loading?
5. What are various types of adsorption isotherm?
6. Define leaching and give two examples.
7. Define molal absolute humidity.
8. Write about crystal nucleation.
9. List out various applications of reverse osmosis.
10. What is meant by constant drying condition?

/3437

* 1

[Contd...

9. Define the following :
- (a) Bound moisture content
 - (b) Unbound moisture content
10. What are the factors that influence the rate of drying curve?

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. Write about the classification of mass transfer operations with examples.
12. Explain about steam distillation and mention its applications.
13. An air-ammonia mixture containing 5% ammonia by volume is absorbed in water in a packed column operated at 20° C and 1 atm pressure so as to recover 98% of ammonia. If the inert gas flow rate in the column is 1200 kg/hr m², calculate—
- (a) The minimum mass velocity of water for this column;
 - (b) The number of transfer units in the column taking the operating liquid rate to be 1.25 times the minimum;
 - (c) The height of the packed tower taking the overall transfer coefficient, to be 128.0 kg moles hr (m³) (atm). The relationship for equilibrium in the column is $y = 1.154 x$, where y and x are in mole fraction units.
14. What are the various notations involved in multistage cross current operation for extraction/leaching?
15. Explain the construction and working of a cooling tower with a neat sketch.
16. Explain the construction and working of Swenson-Walker crystallizer, with a neat sketch.

17. (a) Discuss briefly how the number of trays required vary with reflux ratio.
(b) How can the minimum L/G ratio be computed? Explain.
18. (a) Mention the applications of dialysis in industry.
(b) Write a short note on caking of crystals.

065 065 065 065