

Code: 9A23401

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2017

MASS TRANSFER OPERATIONS

(Biotechnology)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Discuss the factors governing the diffusivity of a component in a binary liquid mixture.
(b) Obtain an expression for the steady- state equimolar counter-diffusion of two gases.
- 2 Explain the interphase mass transfer with reference to absorption.
- 3 Explain the different methods of distillation.
- 4 State under what conditions is the process of Liquid – Liquid extraction advisable for the separation of liquid mixtures. Discuss the importance of equilibrium distribution coefficient, selectivity and interfacial tension in the choice of solvent for extraction.
- 5 Discuss in detail the working principles, construction and uses with neat sketches of the following leaching equipment:
(a) Bollmann extractor.
(b) Shanks system.
- 6 (a) Explain the drying curves.
(b) A commercial dryer needed 6 hours to dry a wet solid from a moisture content of 30% to 8% (dry basis). The critical and equilibrium moisture contents were 15% and 4% (dry basis) respectively. Calculate the time needed to dry this material from a moisture content of 35% to 6% (dry basis), if the drying conditions remain unchanged. Assume that the falling rate curve is a straight line.
- 7 What are pressure driven membrane processes? What are their applications? Give your answer with suitable examples.
- 8 Write briefly on:
(a) Absorption of ammonia in water.
(b) Extraction of penicillin.
(c) Crystallization of citric acid.
