



# CBCS SCHEME

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18BT71

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Bioprocess Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Describe kinetic model of growth (Monod). (10 Marks)  
b. Draw a neat sketch of fermenter and explain the components of fermenter. (10 Marks)

OR

- 2 a. Use an example and describe on process design criteria for low volume, high value products. (10 Marks)  
b. Describe on modes of fermentation. (10 Marks)

### Module-2

- 3 a. Discuss strain improvement strategies. (10 Marks)  
b. Illustrate on the production of Antibiotics. (10 Marks)

OR

- 4 a. Demonstrate on the preservation of microbial culture and write a note on industrial applications of secondary metabolites. (10 Marks)  
b. Write short notes on: (i) Elicitation  
(ii) Culture conditions for secondary metabolite production. (10 Marks)

### Module-3

- 5 a. Demonstrate the role and importance of downstream processing in biotechnology. (10 Marks)  
b. Illustrate on differential centrifugation and its biotechnological applications. (10 Marks)

OR

- 6 a. Describe any four cell disruption methods. (10 Marks)  
b. Elaborate on precipitation methods. (10 Marks)

### Module-4

- 7 a. Describe membrane ultra filtration. (10 Marks)  
b. Write a note on : (i) Reverse osmosis. (ii) Separation by solvent membranes. (10 Marks)

OR

- 8 a. Elaborate the use of membrane diffusion as a tool for separating and characterizing naturally occurring polymers. (10 Marks)  
b. Discuss on the design and configuration of membrane separation equipment. (10 Marks)

### Module-5

- 9 a. Classify and explain chromatographic techniques. (10 Marks)  
b. Discuss the principle, instrumentation and working of HPLC. (10 Marks)

OR

- 10 a. Elaborate on Ion Exchange chromatography and its uses in the context of biotechnology. (10 Marks)  
b. Discuss in detail TLC and its application. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.