CBCS SCHEME

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BBT702

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Downstream Process Technology + Lab

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
		Module – 1			
Q.1	a.	Discuss in detail on role and importance of downstream processing in biotechnology.	10	L1	CO1
	b.	Write a explanatory note on economics of downstream process in biotechnology.	10	L2	CO1
		OR			
Q.2	a.	Explain characteristics of biological mixtures relevant for downstream processing.	10	L1	CO1
	b.	Describe the process design criteria for high volume, low value product and low volume, high value product.	10	L2	CO1
		Module – 2			
Q.3	a.	Discuss in detail about mechanical method of cell disruption.	10	L1	CO2
	b.	Explain basic principles and methods of filtration process.	10	L2	CO2
		OR			
Q.4	a.	Give an account on basic principles types and application of centrifugation.	10	L1	CO2
	b.	Explain the process of flocculation and sedimentation.	10	L2	CO2
		Module – 3			
Q.5	a.	Explain principles, type, and methods of distillation process.	10	L2	CO3
	b.	Explain principles and methods of liquid extraction.	10	L3	CO3
		OR			
Q.6	a.	Give a detailed account on characteristics principle and types of adsorption and add a note on its importance.	10	L2	CO3
	b.	What are Evaporators? Explain working of different types of evaporator and their applications.	10	L3	CO3
		Module – 4			
Q.7	a.	Illustrate on different methods of protein precipitation extraction in detail.	10	L3	CO4
	b.	Elaborate on types of membrane separation techniques add a note on its applications.	10	L4	CO4
		OR			
Q.8	a.	Explain principles and mechanism of affinity chromatography in protein purification.	10	L3	CO4
	b.	Infer and explain principles and working of reverse phase chromatography add a note on its application.	10	L4	CO4
		Module – 5			
Q.9	a.	Illustrate on theory of crystallization add a note on working of mixed suspension, mixed product removal crystallizer.	10	L3	CO5
	b.	Elaborate on principle and process of freeze drying.	10	L4	CO5
		OR			
Q.10	a.	Explain in detail on primary and secondary freeze drying.	10	L3	CO5
	b.	Outline on : i. Crystal growth ii. Application of freeze drying.	10	L4	CO5

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