

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)



B. Tech (Sixth Semester - Regular) Examinations, April 2026

23BBTPE36001 - Downstream Processing Engineering (Biotechnology)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

	CO #	Blooms Level
a. Differentiate between intracellular and extracellular bioproduct purification	CO1	K2
b. What does the "RIPP" scheme stand for in downstream processing?	CO1	K1
c. Which chromatography technique is best for separating a target protein from a very dilute, large-volume crude extract? Give its principle	CO2	K3
d. What are the different types of osmotic shocks	CO4	K1
e. Differentiate between Freeze-Thaw method and Lyophilisation method	CO2	K2

PART – B

(10 x 5 = 50 Marks)

Answer ALL the questions

	Marks	CO #	Blooms Level
2. a. What are the problems and requirement of bio products purification in downstream?	05	CO2	K2
b. Illustrate the Characteristics of biological mixtures and bio products.	05	CO1	K2
c. Explain in detail about the cost cutting strategies. Also discuss about the cost economics.	10	CO2	K4
3.a. Discuss about the separation of cells and other insoluble from the fermented broth.	05	CO4	K2
b. Analyse the process of salting out and salting in procedure in detail.	05	CO4	K5
(OR)			
c. How the Filtration process involved in separation and purification process.	05	CO1	K2
d. Explain about the continuous and basket centrifugation working.	05	CO1	K2
4.a. Explain in detail about mechanical method of cell disruption.	05	CO4	K2
b. Explain in detail about the chemical method of cell disruption.	05	Co4	K2
(OR)			
c. Illustrate the Microfiltration process with proper diagram.	05	CO5	K3
d. Explain the process of liquid shear in cell disruption method.	05	CO4	K2
5.a. What is Liquid –liquid extraction. How it involved in purification process	05	CO4	K2
b. Discuss Electro dialysis working with neat diagram.	05	CO6	K3
(OR)			
c. Write in detail about Reverse Osmosis process in purification.	05	CO4	K2
d. Describe briefly about the process of product crystallization.	05	CO6	K2
6.a. Discuss in detail about the formulation and product polishing method.	05	CO6	K2
b. Give a detailed working procedure of Liquid electrophoresis.	05	CO4	K3
(OR)			
c. Differentiate between the Adsorption and Absorption process.	05	CO4	K3
d. Explain about the semipermeable membrane	05	CO3	K2

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