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



**B. Tech (Sixth Semester- Regular/Supplementary) Examinations, April 2025
21BBTPC36003/22BBTPC36003 – Downstream Processing Engineering
(Biotechnology)**

Time: 3 hrs

Maximum: 70 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer ALL questions

	CO #	Blooms Level
a. Define bio-products.	CO1	K1
b. What are direct and indirect costs?	CO2	K3
c. Demonstrate the principle of gas chromatography	CO3	K2
d. Write about the very high value, low volume products.	CO4	K3
e. What is Rf value?	CO1	K3

PART – B

(15 x 4 = 60 Marks)

Answer ALL the questions

	Marks	CO #	Blooms Level
2.a. Explain in detail role and importance of Bioseparation process in biotechnological processes.	8	CO3	K3
b. Explain in detail about the problems and requirements of bioproduct purification.	7	CO3	K2
(OR)			
c. Discuss about the process of classification of Bioproducts	8	CO5	K2
d. Summarize the biological activity analysis of purity	7	CO2	K3
3.a. Analyse the Chromatograph technique in bio separation.	8	CO1	K3
b. Discuss the importance of precipitation technique.	7	CO5	K2
(OR)			
c. Differentiate the Filtration and microfiltration importance's.	8	CO4	K2
d. Compare the different types of centrifugation.	7	CO3	K2
4.a. Differentiate the Enzymatic methods of cell disruption.	8	CO4	K2
b. Explain in detail about the importance of Membrane Geometry	7	CO3	K2
(OR)			
c. Summarize the Semipermeable membrane working , types and application.	8	CO2	K3
d. Explain in detail about the importance of Ultrafiltration Module Configuration	7	CO3	K2
5.a. Analyse the working principles and application of Dialysis	8	CO1	K3
b. Discuss about the Separation of soluble bio-products	7	CO5	K2
(OR)			
c. Analyze in detail about the Absorption.	8	CO1	K3
d. Explain in detail about the importance and methods of drying and crystallization in downstream processing	7	CO3	K2

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