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

B. Tech (Fifth Semester - Regular) Examinations, November 2025

23BBTPE35011 - Bioreactor Design and Analysis

(Biotechnology)

Time: 3 hrs Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	Define Mass Transfer.	CO1	K1
b.	Explain perfusion and Rejuvenation processes.	CO2	K1
c.	Define Fisher Tropsch reaction.	CO3	K1
d.	Expand FLC and PID.	CO4	K3
e.	Write the difference between biosensor and sensor.	CO5	K1

PART – B **(10 x 5 = 50 Marks)**

	Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a.	Summarize the working principle of CSTR.	05	CO1	K2
b.	Describe about Adiabatic reactors.	05	CO1	K2
	(OR)			
c.	Evaluate the principles and factor effecting the Biochemical kinetics of the rate of reaction.	05	CO1	K3
d.	Discuss few ideal characters of a bioreactor which make a bench mark.	05	CO1	K3
3.a.	What are the enzyme catalysed reactions in CSTR?	05	CO2	K1
b.	Analyses the non-ideal characters of a bioreactor.	05	CO2	K3
	(OR)			
c.	Discuss about the Fed-Batch reactors	05	CO2	K3
d.	Write about immobilization of enzymes and different methods.	05	CO2	K1
4.a.	Explain about Gas - liquid reactor.	05	CO3	K2
b.	What is three – phase fluidized bed trickling bed reactor?	05	CO3	K1
	(OR)			
c.	Discuss in detail about mass transfer and write about driving forces	10	CO3	K3
5.a.	Describe about the oxygen transfer in bioreactors with respective to growth curve and KLa	10	CO4	K3
	(OR)			
c.	Write a short note about Rheology of materials	05	CO4	K1
d.	Discuss about the heat transfer in bioreactor	05	CO4	K2
6.a.	Discuss about the materials used for the construction of the bioreactor	05	CO5	K2
b.	Discuss about the valves and pipping in the mechanical fitting of the bioreactor	05	CO5	K2
	(OR)			
c.	Describe in detail about the Biosensors and Sensor used in bioreactor and its types.	10	CO5	K1

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