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

B. Tech (Fifth Semester - Regular) Examinations, November – 2024

22BBTPC35003 – Bioreactor Design and Analysis

(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)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	Write principle of Michaelis - Menten equation.	CO1	K1
b.	What is Residence time distribution?	CO2	K3
c.	Explain about PID and Fuzzy logic control.	CO3	K6
d.	What are the factors affect the driving forces.	CO4	K3
e.	What is Bubble column reactor.	CO1	K3

PART – B **(15 x 4 = 60 Marks)**

		Marks	CO #	Blooms Level
	Answer ***All*** the questions			
2. a.	Analyses the working procedure of Batch reactor.	8	CO1	K3
b.	Evaluate the working of Plug Flow Reactor	7	CO1	K2
	(OR)			
c.	Demonstrate the principle, design and working of CSTR.	8	CO1	K6
d.	Analyse the working procedure of adiabatic and programmed reactors.	7	CO1	K3
3.a.	Demonstrate the Anaerobic Plug-flow Reactor (APFR).	8	CO2	K6
b.	Describe about Concept of non-ideal reactor.	7	CO2	K5
	(OR)			
c.	Summarize the working of Fed-Batch reactors.	8	CO2	K5
d.	Evaluate the Enzyme catalysed reactions in CSTRs.	7	CO2	K2
4.a.	Explain about Three – phase fluidized bed trickling bed reactor.	8	CO3	K4
b.	Describe about immobilization of enzymes and different methods of enzyme immobilization.	7	CO3	K5
	(OR)			
c.	Summarize about Molecular diffusion of Mass Transfer.	8	CO3	K3
d.	Explain about Multiphase Bioreactors.	7	CO3	K5
5.a.	Describe about Oxygen mass transfer.	8	CO4	K5
b.	Justify about Scale up and scale down concepts.	7	CO4	K2
	(OR)			
c.	Demonstrate in brief about Rheology of mass transfer in bioreactors.	8	CO4	K6
d.	Describe in brief about the bioreactor biosensors.	7	CO4	K5

End of Paper