SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

M. Tech (Bio-Technology) I YEAR (I SEM)		
Course Name: Bioprocess Engineering and Technology		**Code: MBT1011**
Time: 02 Hours		**Max Marks: 60**

University Roll No.															
(To be filled by the Student)															

Note: Please read instructions carefully:

a) *The question paper has 03 sections and it is compulsory to attempt all sections.*

b) *All questions of Section A are compulsory; questions in Section B and C contain choice.*

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Summarize the functions of bioreactors and fermenters briefly.	BL2	CLO2	02
2.	Define chemotrophs with examples.	BL1	CLO1	02
3.	What is the role of baffles and sparger in bioreactors ?	BL1	CLO3	02
4.	Why is maintenance energy important in biochemical reactions?	BL1	CLO3	02
5.	What are air- lift bioreactors?	BL1	CLO2	02
Section B: Short Answer Type Questions **Attempt any 03 out of 06 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Discuss role of enzymes and cells in bioprocess engineering.	BL2	CLO2	10
2.	Outline major steps and techniques involved in upstream processing.	BL4	CLO2	10
3.	Explain the importance of sterlization in bioreactors	BL5	CLO1	10
4.	Summarize the major principles of model building for all types of bioreactors.	BL2	CLO2	10
5.	Discuss designing of CSTR bioreactors .	BL2	CLO3	10
6.	Describe the production of green chemicals by bioprocess engineering.	BL2	CLO2	10
Section C: Long Answer Type Questions/Case Study **Attempt any 01 out of 04 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Discuss in detail about the kinetics of cell growth.	BL2	CLO3	20
2.	Outline the role of different types of chemostats in a bioreactor	BL4	CLO3	20
3.	What are the major unit operations involved in development of a biochemical product?	BL1	CLO2	20
4.	Discuss advanced control strategies including PID controllers.	BL2	CLO3	20
