QP Code:R262G024 | Reg. No | | | | | | | | | | | AY 25

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

M.Sc. (Second Semester - Regular) Examinations, May – 2026

24MBIPE12007– Microbial Technology

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)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Name two microbes commonly used in industrial enzyme production.	CO1	K1
b. Describe the role of *Nitrosomonas* in nitrogen cycling.	CO2	K2
c. Identify operational issues in scaling up microbial pharmaceutical production.	CO3	K1
d. Analyze why microbial antibiotics are preferred over chemical preservatives in some foods.	CO4	K4
e. Why metagenomics is preferred over traditional microbiology for discovering novel enzymes?	CO5	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Discuss about the role of microorganisms in human welfare.	5	CO1	K2
b. Describe the principle and working mechanism of TALEs/TALENs in microbial genome manipulation.	5	CO1	K2
(OR)			
c. Discuss the role of recombination process and r-DNA technology in strain improvement.	5	CO1	K2
d. Evaluate the impact of genome editing tools in industrial biotechnology.	5	CO1	K5
3.a. Explain about the mechanism of biomass recycle and removal in environment.	5	CO2	K2
b. Develop a biosensor-based environmental monitoring system for detection of pollutants in contaminated ecosystems.	5	CO2	K6
(OR)			
c. Discuss in detail about the mechanism of bioremediation with its application.	5	CO2	K2
d. Analyze the importance of microbial activities in global nutrient cycling and ecosystem sustainability.	5	CO2	K4
4.a. Explain the concept of microbial cell factories and their importance in industrial biotechnology.	5	CO3	K2
b. Describe the major technical and operational bottlenecks involved in recombinant protein production using microbial systems.	5	CO3	K2
(OR)			
c. Explain the strategies used for generating diversity and introduction of desirable traits in industrially important microorganisms.	5	CO3	K2
d. Discuss the importance of *Streptomyces* and Yeast as industrial hosts for biological production.	5	CO3	K2

5.a.	Discuss about the non-recombinant ways of introducing desirable properties in GRAS microbes to be used in food.	5	CO4	K2
b.	Evaluate the effectiveness of microbial vector–based delivery systems in modern healthcare biotechnology.	5	CO4	K5
	(OR)			
c.	Apply microbial fermentation strategies for enhanced production of antibiotics and enzymes.	5	CO4	K3
d.	Discuss the significance of microbial biotechnology in food processing, preservation, and healthcare product development.	5	CO4	K2
6.a.	Describe the approaches used in microbial genomics for identification of industrially important biomolecules.	5	CO5	K2
b.	Evaluate the significance of metagenomics in understanding microbial diversity and global sustainability.	5	CO5	K5
	(OR)			
c.	Develop a workflow for construction and functional screening of a metagenomic library for industrial enzyme discovery.	5	CO5	K6
d.	Evaluate the scientific and industrial outcomes of global metagenomic projects in biotechnology research.	5	CO5	K5

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