647510 **BSCbtMN352x-5C** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (NEP-2020) Examination

March/April-2026

BIT: Modern Molecular Techniques and Bioinformatic Tools (Theory) (Minor-5)

Time: 2:00 Hours **Marks:50**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1	(1)	Explain PCR, its types, and applications in molecular biology.	(05)
	(2)	Describe the principle and procedure of Pyrosequencing for DNA sequencing.	(05)
		OR	
	(1)	Explain the concept of Next Generation Sequencing (NGS) and its advantages over traditional sequencing.	(05)
	(2)	Describe the artificial synthesis of DNA using a gene machine or DNA synthesizer.	(05)
Que.2	(1)	Describe the DNA footprinting technique and its application in molecular biology.	(05)
	(2)	Explain the concept of chromosome walking in gene identification.	(05)
		OR	
	(1)	Describe the concept and approaches of gene therapy.	(05)
	(2)	Explain the principle and procedure of restriction mapping of DNA.	(05)
Que.3	(1)	Explain the nature of biological data and the importance of biological databases in discovery.	(05)
	(2)	Describe the classification of biological databases based on the Nucleic Acids Research (NAR) journal.	(05)
		OR	
	(1)	Give an overview of the Human Genome Project and its significance.	(05)
	(2)	Explain bioinformatics, its branches, and major applications in biological research.	(05)
Que.4	(1)	Differentiate between primary and secondary biological databases and give examples.	(05)
	(2)	Describe the major nucleic acid sequence databases, including GenBank, ENA, and DDBJ.	(05)
		OR	
	(1)	Explain the major protein databases.	(05)
	(2)	Give an overview of literature databases.	(05)
Que.5	(1)	Describe the Western blotting technique and its use in detecting proteins.	(05)
	(2)	Describe chromosome jumping and how it differs from chromosome walking.	(05)
		OR	
	(1)	Discuss the role of biological databases in genomics, proteomics, and systems biology.	(05)
	(2)	Explain the structural classification of proteins using SCOP and CATH.	(05)

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