Q. Code:510386

Reg. No. | | | | | | | | | | | | | |

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2024

Second Semester

BY22201 – ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

(Biotechnology)

(Regulation 2022)

TIME: 2 HOURS **MAX. MARKS: 60**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Create awareness about the hazardous chemicals and safety precautions in case of emergency.	**2**
CO 2	Learn about the qualitative and quantitative estimation of biomolecules.	**4**
CO 3	Elaborate on the working principle of instruments (pH meter and spectroscopy) used in biochemistry lab.	**4**
CO 4	Analyze the significance of biochemistry in research and clinical sample analysis.	**4**
CO 5	Demonstrate the application of spectroscopic methods in the quantification of bioproduct.	**5**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define mass-to-charge ratio.	**1**	**2**
2.	State the differences between AES from AAS.	**1**	**2**
3.	Briefly explain the principle of Gas Chromatography.	**2**	**2**
4.	Describe one application of 2D electrophoresis in proteomics research.	**2**	**3**
5.	Describe the principle of fluorescence microscopy.	**3**	**3**
6.	Differentiate SEM and TEM in terms of their imaging mechanisms.	**3**	**4**
7.	How does ELISA RIA differ from conventional RIA techniques?	**4**	**4**
8.	Name two safety precautions that should be taken when working with radioactive isotopes.	**4**	**2**
9.	Analyze the purpose of transferring biomolecules onto solid support in blotting	**5**	**4**

techniques.

			Marks	CO	RBT LEVEL
10.		Name three types of biosensors based on the type of bioreceptor used.	**5**	**2**	

PART- B (3 x 10 = 30 Marks)

			Marks	CO	RBT LEVEL
11. (a)		Explain the various components and their functions in UV-Vis spectroscopy.	**(10)**	**1**	**2**
		(OR)			
(b)		Describe the principle of NMR spectroscopy and how it is used to determine the chemical environment of nuclei in a molecule.	**(10)**	**1**	**2**
12. (a)		Discuss the instrumentation used in electrophoresis, including the components of a typical electrophoresis system and their functions.	**(10)**	**2**	**3**
		(OR)			
(b)		Describe the principles of HPLC and the factors that affect the separation of components in a chromatographic system.	**(10)**	**2**	**3**
13. (a)	**(i)**	Differentiate the working principle of confocal microscopy from conventional light microscopy.	**(5)**	**3**	**4**
	(ii)	Describe the principles of radioreceptor assay (RRA) and how it is used to study ligand-receptor interactions.	**(5)**	**4**	**4**
		(OR)			
(b)	**(i)**	Describe the process of sample coating in specimen preparation for SEM.	**(5)**	**3**	**4**
	(ii)	How are tracer techniques using radioactive isotopes used in biological and environmental studies?	**(5)**	**4**	**4**

PART- C (1 x 10 = 10 Marks)

(Q.No.14 is compulsory)

			Marks	CO	RBT LEVEL
14.		Discuss the differences between conventional PCR, quantitative PCR, and	**(10)**	**5**	**5**

reverse transcription PCR, and provide examples of their applications.

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