U.S.N.										

B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT5DCBAT **Max Marks: 100**
Course: Bio analytical Techniques **Date: 13.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

UNIT - I

1. a) Given the following data of standard protein markers that have eluted from a Sephcryl S-100 matrix :- **10**

Mol wt (kDa)	Elution volume (ml)
93	10
67	17
44	21
29	34
14	51

Calculate the elution volume at which proteins of size 50kDa and 32 KDa would elute out. If another protein of unknown molecular weight were to elute at 40 ml, calculate the molecular weight of this protein.

b) Compare HPLC & GC with respect to applications in molecular bio separations. **10**

UNIT - II

2. a) Calculate the mol.wt of a protein that travels to a distance of 2.0 cm on a 10% SDS-PAGE given that standard protein markers of size 67kDa, 44kDa &; 29kDa migrate to distances of 1.2, 2.4 &3.8 cm respectively. If this protein were to be eluted using gel filtration chromatography what would be the parameters taken on X & Y-axes? **10**

b) Distinguish between Affinity and Ion-exchange chromatography. **10**

UNIT - III

3. a) Distinguish between SEM & TEM in terms of applications. **10**

b) Compare fluorescence & phosphorescence in terms of their applications. **10**

OR

4.	a)	How do LC-MS & MALDI-TOF differ from each other?	**10**
	b)	Distinguish between isothermal & differential calorimetry explaining the applications of each.	**10**

UNIT - IV

5.	a)	Compare & contrast single crystal diffraction with fibre diffraction approaches of XRD.	**10**
	b)	Distinguish between IR & UV Spectroscopy.	**10**

OR

6.	a)	Compare ESR/EPR approaches with NMR.	**10**
	b)	"Circular dichroism has revolutionized protein chemistry & structural biology". Do you agree? Whether yes/no, justify.	**10**

UNIT - V

7.	a)	How does the GM counter differ from scintillation counters?	**10**
	b)	Radioisotopes have a wide range of applications but need to be handled with caution". Justify	**10**

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