U.S.N.										

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

Autonomous Institute Affiliated to VTU

July 2024 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 22BT5PCBAT **Max Marks: 100**
Course: BIOANALYTICAL TECHNIQUE

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	CO	PO	Marks
1	a)	How does normal-phase TLC differ from reversed-phased TLC?		CO 1	PO 1,5	6
	b)	A mixture containing hemoglobin, 65,000 Daltons; myoglobin, 17,000 daltons and myosin, 180,000 daltons needs to be separated. Suggest the most suitable chromatographic technique for their separation. Explain the principle and working of the technique		CO 1	PO1, 5	7
	c)	An analyte is eluted from a column with a retention time of 7min. 4 sec. the base peak width is 30 s. Calculate (i) the number of theoretical plates (ii) plate height if the length of the column is 80cm (iii) the capacity factor if Kd is 10 and β is 5		CO 1	PO1, 5	7
			UNIT - II			
2	a)	Identify the electrophoretic technique which is most suitable for separation of proteins having differences in their molecular weights. Explain its principle and procedure		CO 2	PO1, 5	8
	b)	Differentiate between moving boundary and zone electrophoresis		CO 2	PO1, 5	6
	c)	What is IEF? Explain the principle, method of conduction and quantitative analysis of the sample.		CO 2	PO1, 5	6
			UNIT - III			
3	a)	A biochemist is interested in studying the dynamic behavior of a protein molecule like Spectrin. Suggest a suitable technique that can be used. With the help of a schematic explain the principle and working of this technique.		CO 3	PO1, 5,12	7
	b)	Differentiate between Fluorescence & Phosphorescence		CO 3	PO1, 5,12	6

		c)	What is ultracentrifugation? explain the principle and working of analytical and preparative ultracentrifugation	***CO 3***	***PO1, 5,12***	**7**
			OR			
	4	a)	Explain the principle and working of DSC.	***CO 3***	***PO1, 5,12***	**7**
		b)	Explain the principle and working of MALDI _TOF. Add a note on its applications.	***CO 3***	***PO1, 5,12***	**6**
		c)	Visualization of samples under a microscope by applying measuring forces and tunneling current is feasible today. Comment.	***CO 3***	***PO1, 5,12***	**7**
			UNIT - IV			
	5	a)	A researcher needs to select a suitable technique for determining the structure of his sample. He has information that his sample contains unpaired electrons .suggest the most suitable spectroscopy technique that can be applied and why ?	***CO 3***	***PO1, 5,12***	**10**
		b)	What is XRD? Differentiate the methods used for its determination..	***CO 3***	***PO1, 5,12***	**10**
			OR	***CO***	***PO***	
	6	a)	Identify the technique which exploits the magnetic properties of certain nuclei to study physical, chemical, and biological properties of matter. Add a note on its applications	***CO 4***	***PO1, 5, 12***	**10**
		b)	In an IR spectroscopy, which are the functional groups which absorb the spectrum and vibrate and are used for the detection of the compound. How is it different from Raman spectroscopy	***CO 4***	***PO1, 5, 12***	**10**
			UNIT - V	***CO***	***PO***	
	7	a)	A widely-used nuclear imaging technique using scintillation for detecting cancers and examining metabolic activity in humans and animals has been shown recent developments. Discuss the technique with suitable example.	***CO 3***	***PO1, 5, 12***	**12**
		b)	Which are the common isotopes used in radioactive experiments. Discuss the safety y aspects of radioisotope.	***CO 3***	***PO1, 5, 12***	**8**

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