Register Number:……..

KUMARAGURU
college of technology
character is life

B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

BIOTECHNOLOGY

U18BTI4203**:** Instrumental Methods of Analysis

COURSE OUTCOMES

CO1: Understand and apply the statistical principles to solve biological issues, and apply appropriate extraction methodologies to process biological samples.

CO2: Compare, apply and interpret the data of biological solutions acquired from different spectroscopy techniques.

CO3: Describe, apply and evaluate the data originated by chromatographic techniques to solve biological problems.

CO4: Explain, apply and evaluate the data obtained from different electrophoretic techniques.

CO5: Describe and apply mass spectrometry, x-ray diffraction and NMR techniques in the broad field of biotechnology.

CO6: Discuss the fundamentals of centrifugation techniques.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Define signal-to-noise ratio.	CO1	[K_2]
2.	Write the applications of microwave assisted extraction.	CO1	[K_3]
3.	Differentiate between single and double beam spectrophotometer.	CO2	[K_2]
4.	Write the principle behind Fluorometry.	CO2	[K_1]
5.	Recall the factors affecting the resolution of chromatography.	CO3	[K_1]
6.	Why are HPLC columns shorter than GC columns?	CO3	[K_4]
7.	What is electrophoresis?	CO4	[K_2]
8.	Tell the importance of capillary electrophoresis in DNA analysis?	CO4	[K_2]
9.	Write the principle of centrifugation.	CO5	[K_2]
10.	List the applications of analytical centrifugation?	CO6	[K_3]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Discuss the construction and working of supercritical fluid extraction.	8	CO1	[K_2]
	b)	Explain the concept of accuracy, precision, Limit of detection and limit of quantification.	8	CO1	[K_1]
12.	a)	Illustrate the principle, construction, working of Infrared spectroscopy with a neat diagram.	10	CO2	[K_3]
	b)	Summarize the principle and working of circular dichroism.	6	CO2	[K_2]
13.	a)	Explain the theories based on chromatography.	6	CO3	[K_2]
	b)	Discuss the principle, working and applications of Ion exchange chromatography.	10	CO3	[K3]
14.	a)	Explain the principle and working of capillary electrophoresis?	8	CO4	[K_2]
	b)	Describe the principle of SDS-PAGE along with its applications?	8	CO4	[K_3]
15.	a)	Explain the working and applications of mass spectrometry.	8	CO5	[K_2]
	b)	Describe the principle and working of X-ray diffraction.	8	CO5	[K_1]
16.	a)	Differentiate between analytical and preparative centrifugation.	6	CO6	[K_4]
	b)	Explain the principle, construction and working of nuclear magnetic resonance.	10	CO6	[K_1]

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