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 precision and mention the limitations of detection.	CO1	[K_1]
2.	Enumerate the factors affecting extraction process.	CO1	[K_1]
3.	Interpret the working principle of atomic absorption spectroscopy.	CO2	[K_2]
4.	Infer the advantage of fluorometry.	CO2	[K_2]
5.	Outline the principle of thin-layer chromatography.	CO3	[K_2]
6.	Relate the importance of calibration of equipment.	CO3	[K_1]
7.	Abbreviate: PAGE, TGGE, UPLC, GC.	CO4	[K_2]
8.	Extend the properties of isoelectric focusing.	CO4	[K_2]
9.	Outline the principle of XRD.	CO5	[K_2]
10.	Classify centrifugation methods.	CO6	[K_2]

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

11.	a)	Analyse the principle of solvent extraction and discuss the factors affecting extraction process and its applications.	10	CO1	[K_4]
	b)	Compose a note on supercritical fluids based extraction.	6	CO1	[K_2]
12.	a)	Identify the significance of nephelometry in food analysis.	8	CO2	[K_5]
	b)	Generalize the principle and applications of laser light scattering (LLS) technique.	8	CO2	[K_2]
13.	a)	Analyse the working principle and construction of Gel permeation chromatography with a neat diagram.	10	CO3	[K_2]
	b)	Inspect the operating principle and applications of High Performance thin layer Chromatography (HPTLC) in food analysis.	6	CO3	[K_3]
14.	a)	Summarize the principle, instrumentation and applications of pH electrodes	10	CO4	[K_2]
	b)	Examine the applications of Gel permeation chromatography	6	CO4	[K_4]
15.	a)	Explain the concepts underlying electrophoresis and discuss the types and troubleshooting parameters.	10	CO5	[K_4]
	b)	Evaluate the difference between temperature gradient gel electrophoresis and denaturing gradient gel electrophoresis.	6	CO5	[K_4]
16.		Elaborate on the principle, instrumentation and applications Nuclear Magnetic Resonance (NMR).	16	CO6	[K_2]

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