BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M. TECH **SEMESTER : I**
BRANCH: BIOTECH **SESSION : MO/2024**

SUBJECT: BE512 MODERN METHODS OF INSTRUMENTATION

TIME: 3 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	What is the principle of Ion exchange chromatography? Give some examples of cation and anion exchangers.	[5]	CO3	3
Q.1(b)	Explain the different performance factors of a chromatographic instrument.	[5]	CO3	5
Q.2(a)	Design a liquid chromatographic instrument based on the experiments of M. Tswett.	[5]	CO1, CO4	6
Q.2(b)	Design mass spectrometer equipment and show the different stages of analysis.	[5]	CO1, CO4	6
Q.3(a)	Derive the Beer's Lambert law and mention the limiting factors affecting this law.	[5]	CO1, CO2	5
Q.3(b)	Explain the instrumentation and applications of ICP.	[5]	CO3	4
Q.4(a)	Describe the setup of Agarose gel electrophoresis. How will you describe that characteristic (composition, concentration and pH) of buffer affects the electrophoresis process?	[5]	CO4,	4
Q.4(b)	Describe the various steps involved in SDS- PAGE starting from sample preparation.	[5]	CO3, CO4	4
Q.5(a)	What is Curie point? Explain the calibration of the TGA instrument using the Curie point method.	[5]	CO1, CO3	3
Q.5(b)	Describe the instrumentation of TGA. Give any example of thermogravimetric measurement	[5]	CO1, CO4	4

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