BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/2022)

CLASS: BTECH **SEMESTER: MO/2022**
BRANCH: BT **SESSION: 2022-23**

SUBJECT: BE301- BIOANALYTICAL TECHNIQUES

TIME: 03 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*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a)	Compare sedimentation and centrifugation.	[2]
Q.1(b)	Calculate the RCFmin, RCFav and RCFmax for a centrifuge tube rotating at 40000 rpm and in which the distance between the rotation axis and the meniscus is 12 cm and the average distance during centrifugation is 16.5 cm. What will happen to RCFmax, if the rotating speed is further increased by 10000 rpm?	[3]
Q.1(c)	List different types of centrifugations. Illustrate density gradient centrifugation in detail.	[5]
Q.2(a)	How are you going to analyze the isolated samples of DNA to find out its size? Explain the process in detail.	[5]
Q.2(b)	Describe the various steps involved in SDS- PAGE starting from sample preparation.	[5]
Q.3(a)	Why is liquid chromatography a good technique for the separation of analytes?	[2]
Q.3(b)	Explain the instrumentation of HPLC with the help of a schematic diagram.	[3]
Q.3(c)	Explain the principle of ion exchange chromatography. Give examples of cationic and anionic resins used in ion exchange chromatography.	[5]
Q.4(a)	Analyze the relationship between Absorbance, % of transmission and molecular absorptivity and mention the limiting factors affecting this relation.	[5]
Q.4(b)	With a schematic diagram, briefly describe the dual-beam UV spectrophotometer and also mention the differences and advantages over single-beam spectrophotometer.	[5]
Q.5(a)	Describe the instrumentation of TGA. Give one example of thermogravimetric measurement.	[5]
Q.5(b)	Explain the instrumentation of the Mass spectrometer and also explain the different events that take place during analysis.	[5]

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