

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2022 - 23 Examination

Semester: 4
Subject Code: 203144253
Subject Name: Techniques in Biotechnology

Date: 22/03/2023
Time: 2:00pm 4:30pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Fill in the blanks, one word answer, MCQ-not more than Five in (15)

case of MCQ) (All are compulsory) (Each of one mark)

1. Which one is not a step of bioanalysis?

- a) Sample preparation
- b) Data interpretation
- c) Report generation
- d) None

2. Experimental error is

- a) Difference between experimental value and the actual value
- b) Degree of closeness
- c) Set of measurements
- d) None

3. The charged molecules can be separated by

- a) Column chromatography
- b) Ion exchange chromatography
- c) Thin layer chromatography
- d) Affinity chromatography

4. Who employed the term 'Chromatography'?

- a) Tswett
- b) Archer
- c) Richard
- d) Erika

5. Which one is an advantage of Ion-exchange Chromatography (IEC)

- a) High resolving power.
- b) Amplitude
- c) Wave number
- d) None

6. Electrophoresis is the migration of charge particles under the influence of field.

7.force helps to separate and purify mixtures of biological molecules in a liquid medium.

8. GLP is abbreviated as.....

9.molar concentration of Urea is used to solubilize the proteins in the 2D Gel electrophoresis.

10. In the Isoelectric focusing at high pH the protein ischarged

11. Define accuracy and precision.

12. Define gel filtration chromatography and its two applications.

13. What do you understand by biosensors?

14. What are the discrete particles in the context of sedimentation?

15. Write down two applications of 3D bioprinting.

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Discuss the good laboratory practices in details.

B) Describe the principle and applications of IR spectroscopy.

C) Explain the principles and applications of Mass spectroscopy.

D) Discuss the different types of centrifuges and give a proper outline any of them.

Q.3 A) Elaborate the working principle, process and applications of Gas liquid chromatography. **(07)**

B) Discuss the working principle, process and applications of NMR spectroscopy. **(08)**

OR

B) Differentiate between sedimentation and centrifugation. Discuss the different types of sedimentation with examples. **(08)**

Q.4 A) Explain the working principle, methods and applications of SDS-PAGE of Proteins. **(07)**

OR

A) Explain the working principle, methods and applications of 3D Bioprinting. **(07)**

B) What do you understand by amphoteric molecules? Explain the principles, methods and applications of Iso electric focusing. **(08)**