



Seat No. _____

HQ-003-1132004

M. Sc. (Biotech) (Sem. II) (CBCS) Examination

April - 2023

BT - 209 : Biostatistics & Analytical Techniques (2016)

Faculty Code : 003

Subject Code : 1132004

Time : $2\frac{1}{2}$ / Total Marks : 70

1 Answer the following : (Any seven out of Ten, each of 02 marks) **14**

1. What are samples and population mean?
2. State the formula for calculating standard deviation and mean deviation.
3. What is Compton scattering?
4. What is photoelectric absorption?
5. Give the principle of Lambert's law.
6. What is a calorimeter?
7. Define: Fronting
8. Define: Tailing
9. Define: Sedimentation coefficient.
10. What is relative centrifugal force?

2 Answer the following (Any two out of Three, each of 07 marks) **14**

- a. Describe the various measures of dispersion and discuss their merits.
- b. Write short notes on : Frequency Curve, Harmonic and Geometric mean.
- c. With suitable examples from biology, clearly differentiate between a 1-tailed and 2-tailed t-test, and paired and unpaired t-test.

- 3** Answer the following : (each of 07 marks) **14**
- What is meant by Relative Biological Effectiveness (RBE)?
Give the units of radioactivity measurements.
 - Enlist different types of microscopy and discuss any one in detail.

OR

- 3** Answer the following : (each of 07 marks) **14**
- Describe the principle of Flow cytometry and its usefulness in biological systems.
 - State merits and demerits of various light Microscopy.
- 4** Answer the following : (each of 07 marks) **14**
- Describe the principle of the UV, IR and Raman spectroscopies and enlist application in biology.
 - What are the differences between the XRD and ND studies? Explain how neutrons can be used as probes for studying various biological phenomena.
- 5** Answer the following : (Any two out of four, each of 07 marks) **14**
- With the basic theory of sedimentation, describe Moving boundary/Zone Centrifugation.
 - With the fundamentals behind the separation, describe gel permeation and affinity chromatography as steps for protein purification.
 - What do you understand by molecular tagging of proteins? Explain its significance in protein purification.
 - With the brief introduction of chromatography, describe various types of chromatography.
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