

**M. Sc. DEGREE END SEMESTER EXAMINATION : NOVEMBER 2023****SEMESTER 1 : ZOOLOGY****COURSE : 21P1ZOOT03 : BIOPHYSICS, INSTRUMENTATION AND BIOLOGICAL TECHNIQUES***(For Regular - 2023 Admission and Improvement/Supplementary -2022/2021 Admissions)*

Duration : Three Hours

Max. Weights: 30

**PART A****Answer any 8 questions****Weight: 1**

1. Comment on nanomaterials. (U, CO 7)
2. What are the uses of a spectrophotometer? (R, CO 8)
3. What are the different types of ELISAs? (R, CO 8)
4. Write the applications of affinity chromatography. (E)
5. What are the different types of Exocytosis? (R, CO 1)
6. Write a brief note on Symporter. (R, CO 1)
7. Describe the principle involved in scintillation counters. (U)
8. Explain equilibrium density ultracentrifugation. (U)
9. Mention the salient features of a Positron. (U)
10. What is the probability of occurrence of Compton scattering in an irradiated object? (U, CO 2)

**(1 x 8 = 8)****PART B****Answer any 6 questions****Weights: 2**

11. Explain the uses of centrifugation technology in biological studies? (U)
12. Explain the Donnan potential? Comment on Gibbs-Donnan equilibrium (An, CO 1)
13. Comment on electron transport chain? (A, CO 1)
14. Explain briefly the fixation methods used for different types of microscopy. (U, CO 8)
15. Draw the scheme diagram of a Scanning Electron microscope. (A, CO 3)
16. Explain the principle and procedure involved in Radio Immuno Assays. (I)
17. Explain the principle and methodology involved in Autoradiography. Add a note on its uses. (U, CO 6)
18. Describe the process of Paper Electrophoresis. (U, CO 4)

**(2 x 6 = 12)****PART C****Answer any 2 questions****Weights: 5**

19. Discuss in detail the principle and applications of high-Performance Liquid chromatography (E)
20. Discuss the techniques involved in specimen preparation for Electron Microscopy. (E, CO 8)
21. Discuss the principle, working and applications of a Differential Interference Contrast microscope. (E, CO 3)
22. Discuss the technology of atomic absorption spectroscopy (AAS) and its uses in biochemical studies. (E, CO 8)

**(5 x 2 = 10)**

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Interpret the biophysical principles that govern the functioning of life processes.	Cr	5, 6, 12, 13	6
CO 2	Examine the interactions of electromagnetic radiations with the matter.	E	10	1
CO 3	Illustrate the techniques for studying live cells and preserved cells under the microscope.	A	15, 21	7
CO 4	Examine the principles of chromatographic and electrophoretic separation and characterisation of biomolecules.	U	18	2
CO 6	Discover the physics behind radioactivity measurement for medical as well as environmental dosimetry.	U	17	2
CO 7	Explain the basic principles of bio-nanotechnology and its potential in biomedical applications	U	1	1
CO 8	Interpret the principles of colorimetric, spectroscopic, and biochemical assay techniques for monitoring physico-chemical perturbations of life processes.	U	2, 3, 14, 16, 20, 22	16

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;