Reg. No ..... Name **25P148**

M.Sc. DEGREE END SEMESTER EXAMINATION- NOVEMBER 2025

SEMESTER 1 : ZOOLOGY

COURSE : 24P1ZOOT03/ **21P1ZOOT03 : BIOPHYSICS, INSTRUMENTATION AND BIOLOGICAL TECHNIQUES**

(For Regular - 2025 Admission and Improvement/ Supplementary 2024/2023/2022/2021 Admissions)

Time : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	What is a Cryotome?	(R, CO 8)
2.	What is meant by Sandwich ELISA?	(R, CO 8)
3.	Explain the impact of Photoelectric effect on human body.	(U, CO 2)
4.	What is the role of reference electrode in a pH meter?	(R, CO 1)
5.	Explain the concept of nanorobots.	(U, CO 7)
6.	Comment on the significance of Proton pump.	(R, CO 3)
7.	Define the term 'Osmosis'.	(U, CO 1)
8.	Outline the principle of a Differential Interference Contrast microscope.	(U, CO 3)
9.	Describe the principle involved in scintillation counters.	(U)
10.	Enlist any five types of spectroscopies.	(R, CO 8)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	Explain the term 'Pair production'.	(U, CO 2)
12.	Write on the applications of 'Ultracentrifuge' in biomolecular study?	(R)
13.	Outline the features of Affinity chromatography.	(U, CO 4)
14.	Describe the process of Endocytosis.	(U)
15.	Outline the working of a Confocal microscope. Explain its merits and demerits.	(U, CO 3)
16.	How radioactivity is measured? Discuss different types of dosimetric techniques.	(U, CO 6)
17.	Describe the process of 'Facilitated diffusion.	(U, CO 1)
18.	Examine the working principle of Magnetic Resonance Imaging.	(E, CO 8)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19.	Discuss the technology of atomic absorption spectroscopy (AAS) and its uses in biochemical studies.	(E, CO 8)
20.	Outline the process of mitochondrial electron transport and show how it is linked to oxidative phosphorylation (ATP synthesis)?	(A, CO 1)
21.	Present an explanatory note on the biological effects of radiation on living organisms.	(U, CO 2)
22.	Explain the principle types and applications of Electrophoresis	(Cr)

(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	4, 7, 17, 20	9
CO 2	Examine the interactions of electromagnetic radiations with the matter.	E	3, 11, 21	8
CO 3	Illustrate the techniques for studying live cells and preserved cells under the microscope.	A	6, 8, 15	4
CO 4	Examine the principles of chromatographic and electrophoretic separation and characterisation of biomolecules.	U	13	2
CO 6	Discover the physics behind radioactivity measurement for medical as well as environmental dosimetry.	U	16	2
CO 7	Explain the basic principles of bio-nanotechnology and its potential in biomedical applications	U	5	1
CO 8	Interpret the principles of colorimetric, spectroscopic, and biochemical assay techniques for monitoring physico-chemical perturbations of life processes.	U	1, 2, 10, 18, 19	10

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