M. Sc DEGREE END SEMESTER EXAMINATION - OCT 2020 : FEBRUARY 2021
SEMESTER 1 : ZOOLOGY
COURSE : **16P1ZOOT03 : BIOPHYSICS, INSTRUMENTATION AND BIOLOGICAL TECHNIQUES**
(For Regular - 2020 Admission and Supplementary - 2016/2017/2018/2019 Admissions)

Time : Three Hours   Max. Marks: 75

PART A
Answer any 8 (2 marks each)

1. Explain Fick's first law of diffusion.
2. Comment on the functions of $Na^+ K^+$ pump.
3. Comment on the significance of Equilibrium constant (Keq).
4. Mention the effects of radiation on cell division.
5. Explain the principle of a Differential Interference Contrast microscope.
6. Note down the important features of Affinity chromatography.
7. Mention the salient features of PAGE.
8. Comment on the technique of MRI.
9. Briefly explain the technique of autoradiography.
10. Comment on nanosensors.
11. What are the uses of ELISA?
12. Explain the working of a soil pH meter.

                                                                                          (2 x 8 = 16)

PART B
Answer any 7 (5 marks each)

13. Prepare an explanatory note on Artificial membranes.
14. Describe the effects of radiation at the tissue level.
15. Explain the working of a Scanning Tunneling microscope. What are its applications?
16. Write an account on Gas chromatography. In what way it is different from HPLC?
17. Briefly outline the various types of Electrophoresis.
18. Describe the features of NMR spectral analysis. Add a note on its uses in biology.
19. Comment on centrifugation technology used in biological studies?
20. Describe the functioning of radiation detection devices.
21. Explain the principle and procedure involved in Radio ImmunoAssays.
22. Elaborate the staining procedure for protein and nucleic acid histochemistry.

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PART C
Answer any 2 (12 marks each)

23. Describe the principle, working and applications of a Transmission Electron microscope.
24. Give a detailed account of HPLC. In what way it is different from GC?
25. Discuss the principle and methodology involved in flame emission and atomic absorption spectroscopy.
26. Explain the principle and methodology involved in density gradient ultracentrifugation.

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