**QP Code: P25DRIS015**

**Reg. No : .....**
**Name : .....**

# ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

## I SEMESTER (CBCSS - PG) DEGREE EXAMINATIONS, NOVEMBER 2025
**(Regular/Improvement/Supplementary)**
**M. Sc. Microbiology**
**MBG1C02 : Biophysics and Instrumentation**
**2024 Admission Onwards**

**Time:3 Hours** **Maximum Weightage:30**

### Part A
*Short answer type questions. Answer **any four**. Weightage **2** for each.*
***(4x2 = 8 Weightage)***

1. Explain DNA drug interactions. Give two examples.
2. What are the characteristics of peptide bond?
3. Define proton NMR spectroscopy.
4. Explain Refractometry and its working principle.
5. Explain the safety aspects to prevent radiation hazards.
6. List out the function of CCD camera.
7. Evaluate various application of X-ray diffraction technique in research field.

### Part B
*Short essay-type questions. Answer **any four**. Weightage **3** for each.*
***(4x3 = 12 Weightage)***

8. Explain briefly the concept of enthalpy and entropy.
9. Explain DNA protein interactions in bacteriophage.
10. Briefly explain the principle and applications of ultracentrifugation.
11. Discuss the principle, instrumentation and applications of Capillary Electrophoresis.
12. Briefly describe the principle and applications of dialysis.
13. Evaluate the use of DIC microscopy for imaging live cells compared to phase contrast microscopy. What are its advantages and limitations?
14. Explain the secondary structure of protein with examples.

**Turn Over**

## Part C

*Essay-type questions. Answer **any two**. Weightage **5** for each.*
***(2x5 = 10 Weightage)***

15. What are physio chemical forces? Describe the different types of physiochemical forces that act between molecules.
16. Evaluate the effectiveness of using the MASCOT database for protein mass fingerprinting in proteomics research.
17. Give a detailed account on the principle, instrument design, working and applications of UV-Visible spectroscopy. Comment on its advantages over other spectroscopy.
18. How does choice of stationary phase affects different chromatograpraphy techniques?

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