**ST JOSEPH’S UNIVERSITY, BENGALURU - 27**

**M.Sc. BIOTECHNOLOGY – I SEMESTER**

**SEMESTER EXAMINATION: OCTOBER 2022**

**(Examination conducted in December 2022)**

**BT7122 - BIOCHEMISTRY AND ANALYTICAL TECHNIQUES**

**Time: 2 Hours Max Marks: 50**

**This paper contains ONE printed page and THREE parts**

**Part A - Answer any SEVEN questions: 2 x 7 = 14 marks**

1. Define epimers with a suitable example.
2. Briefly describe the composition of waxes.
3. State the role of proline in the secondary structure of proteins.
4. What is the importance of *cis*-configuration of unsaturated fatty acids?
5. State the importances of *Vmax* and *Km* in enzyme catalysis.
6. What are scintillation counters? Mention the different types.
7. Which spectroscopic technique is better for studies based on size of the particle? State your reasons.
8. A scientist wants to understand the structure of cellular organelles. Which analytical technique will you recommend and why?
9. State the principle behind atomic force microscopy. What information can be obtained using this technique?

**Part B - Answer any FOUR questions: 5 x 4 = 20 marks**

1. Explain the mechanism of competitive enzyme inhibition.
2. Briefly explain the de novo pathway of pyrimidine synthesis.
3. Describe the structural composition of starch in detail.
4. Write a brief note about paper chromatography. Explain the variants of this technique.
5. State and explain the factors that impact electrophoretic mobility.
6. Explain the principle and separation mechanism using flow cytometry with two applications.

**Part C - Answer any TWO questions: 8 x 2 = 16 marks**

1. a. Explain the quaternary structure of hemoglobin. Briefly explain the mechanism of

gaseous exchange in hemoglobin.

**(OR)**

b. Explain the mechanism of beta oxidation of fatty acids in detail.

1. a. Explain the principle, instrumentation, mass analyzers used in mass spectrometer.

**(OR)**

b. Describe any four types of centrifuges used in biotechnology.