

Register Number:

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ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27

M.Sc. MICROBIOLOGY - I SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in January-March 2022)

**MB 7421 – Microbiological Techniques**

**Time: 2 1/2 hours Max Marks: 70**

This paper contains **2** printed pages and **4** parts

1. **Answer any Five of the following 5X3=15**

1. Name two macromolecules that have hydrogen bonds as a part of their structures?

2. What are the different chromophores in proteins and nucleic acids?

3. What are the criteria to attain the best resolution in light microscopy?

4. Which two halogens are used in germicidal preparations? Justify your answer.

5. Sketch the circular dichroism spectra of "pure" secondary structures found in proteins.

6. A microscope with an overall magnification of 600 has an objective lens that magnifies by 200.

 What is the magnification of the eyepiece? Explain

7. Which type of radiation is used in Vibrational spectroscopy and NMR spectroscopy?

1. **Answer any Five of the following 5X5=25**

8. Explain the phenomenon of proton hopping.

9. Elaborate a method used for the determination of the Minimum Inhibitory Concentration (MIC) of

 an antimicrobial agent.

10. Draw the path of light in a bright field microscope.

11. Name the two common types of electron microscopes. Differentiate between them.

12. How does Tyndallization brings about sterilization?

13. What is fluorescence quenching? Explain the different types of quenching.

14. List the different ionization methods of Mass Spectroscopy. Explain any one.

**III**. **Answer any Two of the following 2X10=20**

15. Explain the working of an atomic force microscope. Why AFM is being widely used as an

 imaging tool in biological studies.

16. Which electrophoretic technique is used regularly for analysing nucleic acids? Explain.

17 a. Explain how denaturing-gradient gel electrophoresis is used to assess the microbial

 community in environmental samples. **7**

b. Explain oligodynamic actions of heavy metals. **3**

**IV. Answer the following 1X10=10**

18 a. You have a mixture of three different proteins A, B and C. The molecular size of Protein A

 is 20 kDa, protein B is 65 kDa and protein C is 50 kDa. What is the order of elution of the

 proteins on a molecular exclusion chromatographic column? Why is this so? **2+3**

 b. Identify the chromatography technique shown below and write the basis for the separation

 of analytes by the technique? **1+4**

