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Register Number:

Date:

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

**B.Sc. BIOTECHNOLOGY– II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2022**

**(Examination conducted in July 2022)**

**BT 221: Microbiological Methods**

**Time- 2 hours Max Marks – 60**

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

**Section A**

**I. Answer any *TEN* of the followingquestions 10 x 2 = 20**

1. The generation time of a bacterium is 30 minutes. If you have inoculated 1000 bacterial cells, how many bacterial cells will be present after 3 hours?
2. What are the components of a microbial culture media?
3. What is MIC and MBC?
4. What are the general biochemical modes of antimicrobial action?
5. What is Multi Drug Resistance?
6. What is IC50? Is a higher or lower IC50 value better?
7. Compare vegetative cells of bacteria with bacterial spores in terms of resistance to heat. What is the reason for this difference?
8. Define the terms Thermal death time and decimal reduction time.
9. You are given 3 tubes A, B and C which contain one sample of either protein or DNA or RNA. Using UV-Visible absorption spectroscopy, how do you distinguish which tube contains what?
10. Mention any two techniques used for detecting colourless spots.
11. What is Tyndallization?
12. Why do electron microscopes have a better resolution than light microscopes? Calculate the resolving power of a microscope of numerical aperture 0.4 and the wavelength of illuminating light is 550nm.

**Section B**

**II. Answer any *FOUR* ofthe followingquestions 4 x 5 = 20**

13. What are the methods used to assess antibacterial activity?

14. Explain the mode of action of any two antiviral agents?

15. Different species of microorganisms can grow in a wide range of environments – from the Antarctic to hot springs to common human pathogens, from ocean floor to the Great Salt Lake. How do you classify the microbes thriving in each of these environments?

16. Explain the role of ultraviolet light and ionizing radiations as sterilizing agents.

17. a) Write a note on ultracentrifuge.

b) A centrifuge rotor is spinning at 25,000 r.p.m. The ‘top’ of the cell is 5.5 cm from the rotor’s central axis, and the ‘bottom’ of the cell is 9.5 cm from the central axis. What is the g-forces on a particle at the top and at the bottom of the tube?

**Section C**

**III. Answer the followingquestions 2 x 10 = 20**

18. What is the working principle of a bright field microscope? Explain how you will increase the visibility of the bacterial cells under the bright field microscope.

19. a. Explain the methods used to culture anaerobic bacteria.

**OR**

b. Explain how sterilization is achieved by chemical methods.