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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## December 2023 Supplementary Examinations

**Programme: B.E.**

**Semester: III**

**Branch: Biotechnology**

**Duration: 3 hrs.**

**Course Code: 22BT3PCMBG**

**Max Marks: 100**

**Course: Microbiology**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

### UNIT - I

1	a) Explain the preparation of biological sample for Transmission electron microscope.	10
	b) The Microbiologist describes microbes that graces the livelihood of Human beings. Justify his statement that Microbes are beneficial for Humankind and environment.	10

### UNIT - II

2	a) Describe the morphology and ultra-structure of Gram +ve and Gram -ve Bacteria.	10
	b) Discuss the selection of raw materials for preparation of media and give detail composition of any lab media.	10

### OR

3	a) Describe the Bacterial Growth curve with respect to Michealis Menten Equation and explain Idiophase and Tropophase importance.	10
	b) Assess the direct and indirect methods of Measurement of bacterial growth with a neat and suitable example.	10

### UNIT - III

4	a) Distinguish glycolysis from HMP pathway with respect to products formed and energy involved or produced.	10
	b) Presence of F factor in some bacteria give them advantage over others which lack it. Justify.	10

### OR

5	a) Assume that glucose is provided to bacteria <i>Zymomonas mobilis</i> and the bacteria cannot process it through glycolysis. Mention and describe an alternate pathway that the bacteria can catalyze.	10
	b) Describe specialized transduction in bacteria.	10

### UNIT - IV

6	a) Discuss the types, mechanism of action and applications of Halogens, Heavy metals and dyes as antimicrobial agents.	10
	b) Three cultures of the bacteria namely culture A, B and C and were incubated with three different antibiotics. After incubation for 48 hr none of the cultures	10

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
Revealing of identification, appeal to evaluator will be treated as malpractice.

could able to form colonies when plated on nutrient agar. Further investigations of the cultures revealed following observations.

- A. Culture A showed the replication fork in the mid of the replicating DNA
- B. Culture B showed some peptide analogue at A site in ribosome complex and the protein was incomplete
- C. Culture C showed osmotic variations in membrane and the cell was bulged.

- i. Name the appropriate antibiotics responsible for the observations made in the mentioned cultures. Also provide the names of the producer organisms.
- ii. Diagrammatically represent the mechanism of action.

### **UNIT – V**

7 a) Discuss *Rhizobium sp.* as an efficient microbial consortium in fixing atmospheric nitrogen and in assisting the plants to uptake the same with a neat diagram. 10

b) Define biogeochemical cycles. With a neat diagram explain the recycling of carbon in the environment. 10

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