



**B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023**

(Regulation 2018)

Third Semester

**BIOTECHNOLOGY**

U18BTI3204: Microbiology

**COURSE OUTCOMES**

- CO1:** Comprehend knowledge about the taxonomical classifications and fundamentals of Microscopy.
- CO2:** Recognize the fundamental concepts in the structure and functioning of a microbial cell.
- CO3:** Understand concepts of nutritional requirements for microbial growth and pure culture isolation.
- CO4:** Demonstrate the microbial nutritional requirements for growth and metabolism.
- CO5:** Understand the controlling of microbes using physical and chemical methods.
- CO6:** Apply and evaluate the antibiotics and antifungal agents to control the microbial species.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

- |   |                       |
|---|-----------------------|
| 1. List any two contributions of Louis Pasteur.                     | CO1 [K <sub>2</sub> ] |
| 2. Abbreviate: SEM and TEM.   | CO1 [K <sub>3</sub> ] |
| 3. Give one example for fission yeast and budding yeast.            | CO2 [K <sub>2</sub> ] |
| 4. Draw the simple sporogonic cycle of protozoa.                    | CO2 [K <sub>2</sub> ] |
| 5. How will you prepare one Liter of PDA medium using raw potatoes? | CO3 [K <sub>2</sub> ] |
| 6. Define specific growth rate.                                     | CO3 [K <sub>2</sub> ] |
| 7. Write the formula to express cell population as CFU/ml.          | CO4 [K <sub>3</sub> ] |
| 8. Give any two indirect methods to measure bacterial growth.       | CO4 [K <sub>3</sub> ] |
| 9. Distinguish antiseptic and disinfectant.                         | CO5 [K <sub>2</sub> ] |
| 10. Classify antibiotics based on mode of action.                   | CO6 [K <sub>2</sub> ] |

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**(Answer not more than 400 words)**

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|-----|----|---|----|-----|-------------------|
| 11. | a) | Suggest staining procedures to identify the morphology and cell arrangement for the given organisms and infer the expected results:     | 10 | CO1 | [K <sub>4</sub> ] |
|     |    | i. <i>E. coli</i> .   |    |     |                   |
|     |    | ii. <i>Staphylococcus aureus</i> .  |    |     |                   |
|     | b) | Illustrate the procedure to prepare the specimens for electron microscopy technique.  | 6  | CO1 | [K <sub>3</sub> ] |
| 12. | a) | Distinguish the structural similarity of <i>E. coli</i> with an eukaryotic plant or mammalian cell with suitable illustration.          | 10 | CO2 | [K <sub>3</sub> ] |
|     | b) | Compare lytic and lysogenic cycle of bacteriophage.   | 6  | CO2 | [K <sub>2</sub> ] |
| 13. | a) | Mention any two pure culture isolation techniques and narrate its merits and demerits.  | 10 | CO3 | [K <sub>3</sub> ] |
|     | b) | Classify microbes based on nutritional requirements.  | 6  | CO3 | [K <sub>2</sub> ] |
| 14. | a) | Narrate the four different stages of aerobic respiration with suitable illustrations.   | 10 | CO4 | [K <sub>3</sub> ] |
|     | b) | Calculate the generation time of a bacterial population that increase from 10,000 cells to 10,000,000 cells in four hours of growth.    | 6  | CO4 | [K <sub>3</sub> ] |
| 15. | a) | Infer the effectiveness of sterilization technique.   | 10 | CO5 | [K <sub>3</sub> ] |
|     | b) | “Cell culture media and their components are sterilized by filtration”. Justify the statement.  | 6  | CO5 | [K <sub>3</sub> ] |
| 16. | a) | Recommend one antibacterial, antifungal, antiviral and antiparasitic agent with their mode of action for a specific infectious disease. | 10 | CO6 | [K <sub>3</sub> ] |
|     | b) | Suggest preventive measures to overcome nosocomial infections.  | 6  | CO6 | [K <sub>3</sub> ] |

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