Register Number:……..

KUMARAGURU
college of technology
character is life

**B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 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. | Mention two advantages of Light microscopy and Electron microscopy. | CO1 | [$K_2$] |
| 2. | Illustrate gram staining procedure. | CO1 | [$K_3$] |
| 3. | Draw the structure of gram-positive bacterial cell wall. | CO2 | [$K_2$] |
| 4. | Classify bacteria based on arrangement. | CO2 | [$K_3$] |
| 5. | Draw all four phases of bacterial growth curve. | CO3 | [$K_2$] |
| 6. | Mention two methods to quantify bacterial growth. | CO3 | [$K_2$] |
| 7. | Classify microbes based on nutrients requirements. | CO4 | [$K_3$] |
| 8. | Differentiate antiseptic and disinfectants. | CO4 | [$K_2$] |
| 9. | Differentiate physical and chemical methods for control of microbial growth. | CO5 | [$K_2$] |
| 10. | List two antibiotics and their mode of action. | CO6 | [$K_2$] |

**Answer any FIVE Questions:-**
**PART B (5 x 16 = 80 Marks)**
**(Answer not more than 400 words)**

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | Identify microbes based on shape, size and structure - Give one procedure for each and compare all three-staining procedure. | 8 | CO1 | [$K_4$] |
| | b) | You are instructed to classify bacteria that available in Microbiology Laboratory based on taxonomy- How will you classify given *E.coli* by considering taxonomic ranking? | 8 | CO1 | [$K_4$] |
| 12. | a) | Distinguish prokaryotic and eukaryotic cell based on cell structure and cellular organelles distribution. | 8 | CO2 | [$K_3$] |
| | b) | Draw a structure and replication of $T_4$ bacteriophages. | 8 | CO2 | [$K_2$] |
| 13. | a) | Tabulate the different types of media formulated based on nutritional factors | 8 | CO3 | [$K_2$] |
| | b) | Illustrate bacterial binary fission -Stepwise | 8 | CO3 | [$K_3$] |
| 14. | a) | Name the major elements their sources and tabulate the elements which are useful in bacterial cellular functions. | 8 | CO4 | [$K_2$] |
| | b) | Narrate factors that directly affect microbial growth under invitro conditions. | 8 | CO4 | [$K_3$] |
| 15. | a) | Highlight the Krebs cycle in aerobic system to understand steps – Use appropriate diagram when possible. | 8 | CO5 | [$K_3$] |
| | b) | Explain in detailed about the first stage of aerobic system -Glycolysis. | 8 | CO5 | [$K_2$] |
| 16. | a) | How will you eliminate microbial contamination by using physical and chemical methods – Explain with step-by-step procedure. | 8 | CO6 | [$K_4$] |
| | b) | Compare any two antibiotics and their mode of action. | 8 | CO6 | [$K_3$] |

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