Reg. No. : | | | | | | | | | | | | |

Question Paper Code: 2143209

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Third Semester
Biotechnology
U20BT302 – ESSENTIALS OF MICROBIOLOGY
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Differentiate light microscope with an electron microscope.

2. Write the principle of Gram's Staining.

3. How does the structure of a bacterial cell differ from that of a virus?

4. State the structural features of mycoplasma.

5. Draw the different phases of bacterial growth.

6. What are the methods used for measuring the growth of bacteria?

7. What is the primary mode of action of penicillin on bacterial cells?

8. Define Sterilization.

9. What is bioremediation?

10. How do microorganisms help in controlling environmental pollution?

PART – B (5 x 16 = 80 Marks)

11. (a) (i) Trace the key milestones in the history of microbiology, highlighting the contributions of major scientists. (8)

(ii) Explain the principles of classification and nomenclature of microorganisms. (8)

(OR)

(b) Explain the principles behind different staining techniques used in microbiology, including Gram staining, acid-fast staining, and flagellar staining. (16)

12. (a) Discuss the structural organization of bacteria and fungi with the key differences in their cell structures with a neat sketch. (16)

(OR)

(b) Describe the characteristics study used for the identification and differentiation of bacterial species for colony morphology in bacteria. (16)

13. (a) Infer the nutritional requirements of bacteria for the optimal growth and growth factors based on the bacterium's metabolic needs. (16)

(OR)

(b) Given a strain of bacteria used in industrial applications, apply preservation techniques to ensure its viability over time. (16)

14. (a) Design a sterilization protocol for a microbiology laboratory based on the specific types of materials and equipment being sterilized. (16)

(OR)

(b) Assess the principles of filtration and pasteurization for the treatment of drinking water and dairy products with a case study. (16)

15. (a) Develop the steps involved in the production of bio-fertilizers and bio-pesticides using microorganisms for sustainable agricultural practices. (16)

(OR)

(b) Apply the concepts of synergism and mutualism to microbial interactions within an ecosystem. (16)

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