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Question Paper Code:R3B06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Third Semester

R21UBM306–PATHOLOGY AND MICROBIOLOGY

Biomedical Engineering

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define Metaplasia. CO1-U
2. Define autopsy and biopsy. CO1- U
3. A diabetic patient experiences slow fracture healing. What could be the possible reason based on your understanding of bone repair? CO2-App
4. Differentiate Edema and Effusion. CO1- U
5. Mention one unique feature of Archaea that helps them survive in extreme environments. CO1- U
6. During the identification of an unknown bacterial sample, a student performs the Voges-Proskauer (VP) test. The test result turns red after the addition of Barritt's reagents. Based on this result:
What does the red color indicate about the organism's metabolism? CO2-App
7. Differentiate TEM and SEM based on sample preparation and resolution CO1- U
8. If a bacterial culture is exposed to UV light, which is known to induce mutations. After exposure, the bacteria are grown on a selective medium. Whether the bacteria will grow on this medium? If so what kind of changes will happen? CO3 –App
9. Define Opsonization. CO1- U
10. State the primary reactions of Antigen-Antibody. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Give a brief note on intracellular accumulations and its various types due to the accumulation process. **CO1 - U** (16)
Or
(b) Summarize the process of cryopreservation and Cryo-sectioning. **CO1 - U** (16)
12. (a) During a clinical examination, a patient is subjected to bleeding time and clotting time tests. Apply your understanding to explain how these tests help in analyzing the function of body fluids, and interpret the possible abnormalities if the bleeding time is prolonged but clotting time is normal. **CO3-App** (16)
Or
(b) Apply the concepts of pathological and clinical differences to explain why Hodgkin lymphoma usually has a better prognosis than Non-Hodgkin lymphoma. In your answer, compare both conditions in terms of clinical presentation, pattern of spread, and microscopic features. **CO3-App** (16)
13. (a) Illustrate the various types of Prokaryotic and Eukaryotic microbes with their nature. Explain the following. a. Archea b. Yeast c. Molds. d. Protozoa. **CO1 - U** (16)
Or
(b) How viruses are grown and explain its growth pattern with the sketch. **CO1 - U** (16)
14. (a) Illustrate the working principles of a. TEM b. SEM. **CO1 - U** (16)
Or
(b) Discuss the genome of the following. a. RNA Phages b. RNA Viruses c. Retro Viruses. **CO1 - U** (16)
15. (a) Discuss in detail about Antibodies and its types. **CO1 - U** (16)
Or
(b) What are the disease caused by the Protozoa? Detail the lifecycle of any one of the protozoa diseases. **CO1 - U** (16)