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Question Paper Code: U4B05

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Fourth Semester

Biomedical Engineering

21UBM405- PATHOLOGY AND MICROBIOLOGY

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Justify. Why apoptosis process is mandatory in case of normal cell growth and metabolism. CO1 -U
2. How do you distinguish autopsy and biopsy using tissue processing techniques? CO1- U
3. What do you mean by hemorrhagic disorders? CO1- U
4. Define hematologic disorders CO1- U
5. Comparative analysis of physical and chemical sterilization? CO2 -App
6. Discuss the bacterial growth pattern. CO1- U
7. Draw a schematic representation of the operon model? CO1 -U
8. How do you differentiate RNA from DNA? CO1 -U
9. State the role of T lymphocytes against antigens? CO1 -U
10. Why are basophils more specific for allergic reactions? CO1 -U

PART – B (5 x 16= 80 Marks)

11. (a) Analyze the mechanism of formation of malignant tumors in various organs through systemic circulation and body fluid and explain which one of the approaches is more rapid to spread tumors in human body. CO2- App (16)
- Or
- (b) How do you justify the inflammation and repair mechanism of wound healing with high efficiency and summarize how this approach will involve in case of treating pathological calcification? CO2- App (16)

12. (a) Compare and contrast the physiological and pathological roles of the intrinsic and extrinsic pathways of blood coagulation. How do these pathways contribute to normal hemostasis, and what happens when they are dysregulated? CO1 -U (16)
- Or
- (b) Summarize the process of edema and its impact on Fluid and hemodynamic derangements and comparative analysis of edema and thrombosis in human blood vessels. CO1- U (16)
13. (a) Apply the concept of culture techniques using various media compositions to the culture of rare microbes in aerobic conditions and analyze the bacterial growth pattern of that rare microbes using colony counter approach. CO2 -App (16)
- Or
- (b) Apply the concept of the Voges-Proskauer test to distinguish deadly pathogens such as Salmonella and Klebsiella species in the incidence of illness in hospitals, especially in intensive care units. CO2- App (16)
14. (a) Investigate the process of gene regulation in bacteria using the operon concept and prove of concept of toxic gene transfer through the Griffith model using various experiments. CO2 -App (16)
- Or
- (b) Study of various microscope methods and their principles for differentiation of microbes and in particular analysis of compound microscope for detection of microscope and their appearance. CO2- App (16)
15. (a) Examine various Immunological techniques to identify virus and antibody interactions and apply the concepts of mono-clonal antibody technology for the tumor treatment. CO2 -App (16)
- Or
- (b) Apply the antigen-antibody interaction mechanism to study the recent new coronavirus infection in humans, and analyze and suggest conventional methods to boost human immune system for rapid pathogen elimination. CO2- App (16)