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

Question Paper Code: R3B06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Biomedical Engineering

R21UBM306-PATHOLOGY AND MICROBIOLOGY

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	How will you find out platelet activation during hemostasis?	CO1 -U
2.	Write the steps involved in estimation of microtome tissue sectioning.	CO1 -U
3.	Differentiate bleeding time and clotting time	CO1 -U
4.	Examine the factors responsible for emboli and infarcts.	CO1 -U
5.	Draw the structural organization of a bacteria, which is grown under the enriched media condition.	CO1 -U
6.	Why the isolation of organism is required?	CO1 -U
7.	Could you give me some examples of both acid-fast and non-acid-fast organisms.	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?	CO1 -U
9.	What will be the cause due to the absence of elements of the immune system?	CO1 -U
10.	What are the key processes involved in the interaction between antigens and antibodies?	CO1 -U

PART – B (5 x 16= 80 Marks)

11.	(a)	Given a scenario where a bacterial infection is present, how do antibodies assist in removing the bacteria.	CO1 - U	(16)

Or

	(b)	Evaluate the importance of each step in tissue processing and propose modifications to optimize the process for different types of tissues, such as fatty or delicate tissues. Use a diagram to illustrate your optimized tissue processing protocol."	CO1 - U	(16)
12.	(a)	Design a treatment plan that addresses both edema and thrombosis in a patient with cardiovascular disease, explaining how each intervention targets the distinct underlying mechanisms of these conditions while considering potential interactions.	CO1 - U	(16)
		Or		
	(b)	Critically evaluate the effectiveness of various diagnostic methods for assessing bleeding and clotting disorders. How do factors like accuracy, time, and patient condition influence the choice of bleeding and clotting time tests in clinical practice?	CO1 - U	(16)
13.	(a)	Demonstrate how you would calculate the amount of nutrient broth needed to prepare 100 ml of sample for AFB staining, given the ratio 10g/1000ml.	CO1 - U	(16)
		Or		
	(b)	How would you modify the current nutrient broth preparation to test for improved AFB staining accuracy in a laboratory setting?	CO1 - U	(16)
14.	(a)	If you Perform the Ames test with a suspected mutagen using a bacterial strain both with and without a metabolic activation system. The results show that the number of colonies increases significantly only in the presence of the metabolic activation system. a. Explain why the presence of a metabolic activation system affects the number of colonies.	CO2 - App	(16)
		Or		
	(b)	(i) Explain the double-helix structure of DNA and its significance in the gene transfer mechanism	CO2 - App	(8)
		(ii) How would you identify the mutation mechanism in a bacterial strain that has developed antibiotic resistance?	CO2 - App	(8)
15.	(a)	How would you demonstrate an antigen-antibody reaction in a laboratory setting? Describe the steps involved	CO1 - U	(16)
		Or		
	(b)	Explain the basic principles behind each type of immunological technique, such as ELISA, Western blotting, and flow cytometry.	CO1 - U	(16)