

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***Second Semester**Biomedical Engineering***BM3251/UBMT24201 - Biosciences for Medical Engineering***Regulations -2021/2024**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Water makes an excellent biological solvent- Justify.	L5	1	2
2.	Mention the key properties of biomolecules that determine their biological functions.	L2	1	2
3.	Sketch the chemical structure of any one disaccharide.	L2	2	2
4.	Compare DNA and RNA.	L4	2	2
5.	List the causes of cell injury.	L2	3	2
6.	Define carcinogenesis.	L1	3	2
7.	Interpret the different types of embolism and their potential effects on the body.	L2	4	2
8.	Classify hemorrhage based on the site of occurrence and explain its possible causes.	L2	4	2
9.	Differentiate bacteria and virus. Give suitable examples.	L2	5	2
10.	Expand ELISA. Mention its importance in cancer therapy.	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a Explain Henderson-Hasselbalch equation and its significance in maintaining acid-base balance in biological systems.	L2	1	16
	Or			
	b Describe the structure and function of biological membranes. Also, highlight their role in cellular processes.	L2	1	16
12.	a i Describe the classification of lipids, highlighting the differences between simple, compound, and derived lipids with suitable examples.	L2	2	10
	i Explain the nomenclature of fatty acids, including the criteria used for naming and the significance of saturated and unsaturated fatty acids.	L2	2	6

Or

	b	Describe the double helical structure of DNA as proposed by Watson and Crick. Explain its key features and the significance of base pairing in the structure.	L2	2	16
13.	a	Elaborate the process of apoptosis, including its molecular mechanisms, key regulatory proteins, and the differences between apoptosis and necrosis. Discuss its significance in development, tissue homeostasis, and disease.	L2	3	16
		Or			
	b i	Differentiate between benign and malignant tumors in terms of their characteristics, growth patterns, and potential impact on the body.	L2	3	6
	i	Explain the roles of autopsy and biopsy in tumor spread	L2	3	10
	i	mechanisms/investigations.			
14.	a	Explain the pathophysiology of edema, including the mechanisms that lead to fluid accumulation in tissues. Discuss the different types of edema, their causes, and the clinical significance of edema in various medical conditions.	L2	4	16
		Or			
	b	Discuss the different types of bleeding disorders, including their causes, pathophysiology, and clinical features.	L2	4	16
15.	a	Elaborate on the electron microscopy techniques: TEM and SEM with necessary diagrams.	L2	5	16
		Or			
	b	Explain the mechanisms of antibody-mediated and cell-mediated tissue injuries.	L2	5	16