Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Sixth Semester

Biomedical Engineering

CBM362 - Principles of Tissue Engineering

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	What are progenitor cells.	RE	1	2
2.	Define cell culture.	UN	1	2
3.	Define tissue engineering and explain its primary goal.	UN	2	2
4.	What is angiogenesis?	RE	2	2
5.	Define iPSCs.	UN	3	2
6.	Differentiate between pluripotency and multipotency in stem cells.	RE	3	2
7.	What is soft lithography.	UN	4	2
8.	Define electro spinning.	UN	4	2
9.	What is regenerative engineering?	RE	5	2
10.	Name two tissue types commonly regenerated in tissue engineering.	UN	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		Explain the role of cell signaling molecules and growth factors in cell growth and differentiation.	UN	1	13
			Or			
	b	i	Summarize the process of cell culture, including expansion, transfer, storage, and characterization of cells.	AP	1	8
		II	Explain the significance of cell surface markers in identifying and isolating specific cell types.	AN	1	5
12.	a		Explain the composition and role of the extracellular matrix (ECM) in tissue organization and repair.	AN	2	13
			Or			
	b		Outline the various materials used in tissue engineering, including their properties, benefits, and limitations.	UN	2	13
13.	a	i	Explain the various types of stem cells and their sources, including hematopoietic, fetal, and cancer stem cells.	UN	3	8
		ii	Summarize the advantages and disadvantages of each.	UN	3	5
			Or			
	b		Explain the processes of differentiation, dedifferentiation, and maturation in stem cells.	UN	3	13

14.	a	Outline the principles and applications of microfabrication techniques - soft lithography and microcontact printing in tissue engineering.	UN	4	13
		Or			
	b	Summarize the benefits and limitations of solvent casting and particulate leaching methods in scaffold design for tissue engineering applications.	AN	4	13
15.	a	Explain in detail about Cardiac tissue regeneration.	UN	5	13
		Or			
	b	Outline the Regulation, Commercialization and Patenting in tissue engineering.	UN	5	13

*PART – C (Marks 1*15 = 15)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
16.	a	Explain in details of various Sources of stem cells.	UN	3	15
		Or			
	b	Discuss the applications of tissue engineering in the replacement of organs and tissues. Provide one example of how these engineered tissues are used in clinical settings.	UN	5	15