Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Fifth Semester

Biomedical Engineering

CBM332 - Artificial Organs and Implants

Regulations - 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

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

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	What are artificial organs, and how do they differ from natural organs?	L2	1	2
2.	Identify one major complication that can arise after a liver transplant.	L2	1	2
3.	Why biocompatibility is crucial in an implant design?	L2	2	2
4.	Give one example of a successful case study involving organ regeneration.	L1	2	2
5.	How can biocompatibility tests influence the selection of materials for medical implants?	L2	3	2
6.	Suggest one method to prevent corrosion in a metallic biomedical device.	L1	3	2
7.	Specify the role of neuromuscular implants in restoring movement to paralyzed limbs.	L2	4	2
8.	Mention any two challenges the researchers face in developing safe and effective artificial blood.	L1	4	2
9.	Classify the types of dental materials based on their applications.	L2	5	2
10.	Relate recent advancements in tissue engineering to improvements in surgical outcomes.	L2	5	2

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

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Analyze the future of organ replacements by examining technological advancements, potential innovations, and the challenges researchers face in creating effective artificial organs.	L4	1	16
		Or			
	b	Examine the individual organs that can be transplanted: kidney, liver, heart and also each organ, discuss the transplantation process, potential complications, and outcomes.	L4	1	16

12.	a	Identify and analyze clinical problems that commonly require implants for solutions. Discuss how implants address these problems and improve patient outcomes with specific examples.	L3	2	16
		Or			
	b	Present a case study of a specific organ regeneration project, outlining the methodologies, outcomes, and implications for future research in regenerative medicine, as well as key lessons learned.	L3	2	16
13.	a	Discuss the design specifications for effective tissue bonding in implants, emphasizing the importance of modulus matching in reducing stress concentrations at the implant-tissue interface.	L2	3	16
		Or			
	b	Illustrate the design and application of nerve regeneration devices, focusing on current materials and technologies, existing challenges, and potential future directions.	L2	3	16
14.	a	Analyze the types of heart valve implants, including mechanical and biological options, and discuss the factors influencing valve choice and associated complications.	L4	4	16
		Or			
	b	Investigate the design and materials of dialysis membranes in artificial kidneys, focusing on their impact on dialysis efficacy and innovations aimed at enhancing kidney replacement therapies with a neat sketch.	L4	4	16
15.	a	Explain recent advancements in gastrointestinal disorder treatments, highlighting innovations in surgical techniques and biomedical devices, and outline the remaining challenges in improving patient outcomes.	L2	5	16
		Or			
	b	Discuss the recent advancements in regenerative medicine, highlighting promising future directions for repair and replacement therapies and associated challenges.	L2	5	16