U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 23ME7BSBFE **Max Marks: 100**
Course: Biology for Engineers

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		List and discuss any five applications showing how Biology is relevant to Mechanical Engineer.	*CO1*	*PO1*	**10**
	b)		How is blood glucose level regulation carried in the human body? Discuss with the help of a control systems block diagram.	*CO1*	*PO1*	**10**
			OR			
2	a)		Explain the various types of movements through Cell membranes.	*CO1*	*PO1*	**10**
	b)		Explain the different types of chemical reactions with an example. What are the factors that affect the reaction rate?	*CO1*	*PO1*	**10**
			UNIT - II			
3	a)		Classify Bone cells highlighting their function. Draw a schematic of the long bone labelling the various parts.	*CO1*	*PO1*	**10**
	b)		Discuss the types of bone fracture under various loading conditions.	*CO2*	*PO1*	**10**
			UNIT - III			
4	a)		Illustrate the *sliding-filament model* of **muscle** contraction (with necessary sketch).	*CO2*	*PO1*	**10**
	b)		Classify the types of muscles in a human body with a sketch and highlight their salient features.	*CO1*	*PO1*	**10**
			OR			
5	a)		Draw the structure of a myofibril highlighting the constituent of a sarcomere.	*CO1*	*PO1*	**10**
	b)		Discuss the Muscle Contraction and Relaxation theory with a simple sketch of neuromuscular junction.	*CO2*	*PO1*	**10**

			UNIT - IV			
	6	a)	Explain the mechanism of impulse conduction in a synapse with a neat sketch.	*CO1*	*PO1*	**10**
		b)	What are the applications of EMG in ergonomics? Discuss any one application.	*CO3*	*PO1*	**10**
			UNIT - V			
	7	a)	List at least FIVE applications of Bio-Mechanical Engineering and briefly explain the principle.	*CO3*	*PO1*	**10**
		b)	Discuss a case study where application of Bio-Mechanical Engineering has solved or mitigated human discomfort.	*CO3*	*PO1*	**10**

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