U.S.N.										

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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: III**

Branch: Medical Electronics Engineering **Duration: 3 hrs.**

Course Code: 23MD3ESHBS **Max Marks: 100**

Course: Human Biological Systems

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 the functions of cell membrane.	CO1	PO3	**08**
	b)	Define hemostasis. Which are the three stages of hemostasis? Explain.	CO1	PO3	**12**
		OR			
2	a)	How does metabolic rate useful to measure the rate of energy released? Write its significance.	CO1	PO3	**08**
	b)	Why is measure of carbon dioxide production important? How is it measured using respiratory quotient?	CO1	PO3	**06**
	c)	Differentiate between direct and indirect methods of determining metabolic rate.	CO1	PO3	**06**
		UNIT - II			
3	a)	With a neat diagram, explain the intra-arterial pressure changes during cardiac cycle.	CO2	PO2	**10**
	b)	Vasomotor center is considered as a component to regulate heart rate by the nervous mechanism. Elaborate how vasomotor center is formed by three areas.	CO2	PO2	**10**
		OR			
4	a)	Write about the ventricular volume changes during cardiac cycle with a neat figure.	CO2	PO2	**10**
	b)	Enumerate the significance of R-R interval in ECG.	CO2	PO2	**10**

			UNIT - III			
	5	a)	Respiratory tract is the anatomical structure through which air moves in and out. Justify with a neat figure.	*CO3*	*PO4*	**10**
		b)	Intrapleural pressure is one of the pressures exerted in the thoracic cavity and lungs during process of respiration. How is this pressure measured? What is the significance and important functions of intrapleural pressure?	*CO3*	*PO4*	**10**
			OR			
	6	a)	Define compliance. Which are the two types of compliance?	*CO3*	*PO4*	**05**
		b)	What is pulmonary edema? Mention its causes and effects.	*CO3*	*PO4*	**05**
		c)	Write the classification and causes of hypoxia.	*CO3*	*PO4*	**10**
			UNIT - IV			
	7	a)	With a neat diagram, explain the excitability curve of skeletal muscle	*CO4*	*PO2*	**10**
		b)	The transfer of information from motor nerve ending to the muscle fiber through neuromuscular junction is called neuromuscular transmission. Brief the series of events that take place during this process	*CO4*	*PO2*	**10**
			OR			
	8	a)	Neuron is the structural and functional unit of nervous system. How is it classified into different methods?	*CO4*	*PO2*	**10**
		b)	Describe the properties of receptors.	*CO4*	*PO2*	**10**
			UNIT - V			
	9	a)	Kidneys play the principal role in homeostasis. Write the functions of kidney.	*CO4*	*PO2*	**06**
		b)	Briefly explain the different parts of nephron.	*CO4*	*PO2*	**06**
		c)	Elaborate the layers in filtration membrane of glomerular filtration process.	*CO4*	*PO2*	**08**
			OR			
	10	a)	Thyroid and steroid hormones execute their function by acting on genes in the target cells. Write the sequence of events during activation of genes.	*CO4*	*PO2*	**06**
		b)	Which are the six hormones secreted by the anterior pituitary?	*CO4*	*PO2*	**06**
		c)	Explain the five different stages of thyroid hormone synthesis.	*CO4*	*PO2*	**08**

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