U.S.N.										

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

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Medical Electronics Engineering **Duration: 3 hrs.**
Course Code: 23MD4PCDTE / 22MD4PCDTE **Max Marks: 100**
Course: Diagnostic and Therapeutic Equipments

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)	Show the basic system for incorporating digital storage in the oscilloscope displays with a block diagram	CO1	PO1	**08**
	b)	Write a typical microprocessor-based bedside patient monitoring instrument with a neat figure.	CO1	PO1	**12**
		OR			
2	a)	Heart rate is derived by the amplification of the ECG signal and by measuring either the average or instantaneous time intervals between two successive R peaks. Justify this statement.	CO1	PO2	**10**
	b)	With a schematic diagram, discuss how the respiration rate can also be derived by continuously monitoring the CO_2 contained in the subject's alveolar air.	CO1	PO2	**10**
		UNIT - II			
3	a)	Explain the principle of skin reflectance oximeters.	CO2	PO1	**06**
	b)	Describe the Doppler shift blood flowmeter.	CO2	PO1	**06**
	c)	What is the method for in vivo measurement of blood pH? Draw the block diagram of fiber optic-based gas sensor and measurement system	CO2	PO2	**08**
		OR			
4	a)	Discuss in detail the intravascular oximeter working principle.	CO2	PO3	**10**
	b)	Explicate the working principle of NMR blood flow meters.	CO2	PO3	**10**
		UNIT - III			
5	a)	Elaborate the need for cardiac pacemaker and defibrillator.	CO3	PO2	**12**
	b)	Write a schematic diagram of DC defibrillator and explain the principle of working.	CO3	PO2	**08**
		OR			

	6	a)	The assessment of pulmonary function is important in the diagnosis and evaluation of obstructive and restrictive pulmonary diseases. How is pulmonary function analyzers useful in diagnosis?	*CO3*	*PO2*	**10**
		b)	Elaborate the use of nitrogen washout technique for the measurement of volume of gas flowing into and out of the lungs.	*CO3*	*PO2*	**06**
		c)	List the respiratory capacities in the respiratory physiology.	*CO3*	*PO1*	**04**
			UNIT - IV			
	7	a)	Illustrate the simplified circuit diagram of microwave diathermy machine.	*CO2*	*PO2*	**10**
		b)	Mention the precautions to minimize electric hazards while using the biomedical equipments.	*CO2*	*PO2*	**10**
			OR			
	8	a)	Highlight the points to face the Electric shock hazards, Leakage currents while designing of Biomedical equipment's.	*CO2*	*PO2*	**10**
		b)	Discuss the functioning of Short wave diathermy and ultrasonic diathermy.	*CO2*	*PO2*	**10**
			UNIT - V			
	9	a)	Brief the function of dialyzing membrane in the artificial kidney.	*CO3*	*PO3*	**10**
		b)	Discuss about the Mean Airway Pressure, Inspiratory Pause Time, Inspiratory Flow and Expiratory Flow.	*CO3*	*PO3*	**10**
			OR			
	10	a)	List the different types of Hemodialysis. Explain the principle of Hemodialysis systems.	*CO2*	*PO3*	**10**
		b)	Mention different types and explain the working principle of any one type of Respiratory aid.	*CO2*	*PO3*	**10**

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