U.S.N.										

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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**

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

Course Code: 23MD4PCDTE **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.

				CO	PO	Marks
			UNIT - I			
1	a)		Construct the differential amplifier circuit of a bio signal measurement and its working.	*CO1*	*PO1*	**10**
	b)		Analyze the operation of a right leg driven ECG amplifier for minimizing the common-mode signal between the body of the patient and the floating ground.	*CO1*	*PO1*	**10**
			OR			
2	a)		Discuss the various methods used to detect and measure the pulse rate.	*CO1*	*PO1*	**12**
	b)		Explain the working of an isolation amplifiers with optical isolation.	*CO1*	*PO1*	**08**
			UNIT - II			
3	a)		Specify the need for blood gas analyzers in clinical applications. Explain in detail the setup of complete blood gas analyzers with a neat diagram.	*CO1*	*PO1*	**10**
	b)		Differentiate between pure tone and speech audiometer.	*CO1*	*PO1*	**10**
			OR			
4	a)		With a neat block diagram explain the working of ear oximeter.	*CO1*	*PO1*	**10**
	b)		Review the different types of electromagnetic flowmeters.	*CO1*	*PO1*	**10**
			UNIT - III			
5	a)		Elaborate on the process involved in calculating cardiac output through thermal dilution technique.	*CO1*	*PO1*	**10**
	b)		Specify the need for defibrillator and explain the working of DC defibrillator.	*CO1*	*PO1*	**10**

			OR			
	6	a)	For what purpose nitrogen washout technique is employed? Explain its working principle.	*CO1*	*PO1*	**10**
		b)	Identify the basic requirements for any implantable circuit. Discuss the various types of implantable pacemakers.	*CO1*	*PO1*	**10**
			UNIT - IV			
	7	a)	Summarize the various types of electro-surgery techniques commonly employed in practice.	*CO2*	*PO*	**12**
		b)	Enumerate the IS:8607 standard issued by BIS that covers the general and safety requirements of electromedical equipment.	*CO2*	*PO6*	**08**
			OR			
	8	a)	Enumerate the effects of ionizing radiation and suggest the safety measures.	*CO2*	*PO6*	**10**
		b)	Illustrate the application of ultrasound in therapeutic purpose.	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	Differentiate between humidifier, nebulizer and aspirator.	*CO2*	*PO1*	**10**
		b)	With a neat functional diagram explain the positive pressure ventilator.	*CO2*	*PO1*	**10**
			OR			
	10	a)	Identify the commonly used membrane for haemodialysis and justify why it is used extensively.	*CO2*	*PO1*	**08**
		b)	Specify the need for heart lung machine and explain the working principle of oxygenator.	*CO2*	*PO1*	**12**

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