U.S.N.										

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

Autonomous Institute Affiliated to VTU

April 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Medical Electronics Engineering **Duration: 3 hrs.**
Course Code: 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)	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	**08**
	b)	If a patient's blood pressure is 83 mm Hg/50 mm Hg. Calculate MAP and comment on the result.	CO1	PO2	**04**
	c)	Explain the working of an isolation amplifiers with optical isolation.	CO1	PO2	**08**
		OR			
2	a)	Imagine a situation where the cuff is not precisely positioned to measure the blood pressure. Which one of the method you will suggest for blood pressure measurements. Justify with relevant diagram	CO1	PO2	**10**
	b)	Define common-mode rejection ratio (CMRR) and construct the differential amplifier circuit of a bio signal measurement and its working.	CO1	PO2	**10**
		UNIT - II			
3	a)	How are blood gas Analyzers helpful for clinical applications? Explain in detail the setup of complete blood gas analyzers with a neat diagram.	CO1	PO2	**12**
	b)	Illustrate the working principle of digital hearing aid with a neat block diagram.	CO1	PO1	**08**
		UNIT - III			
4	a)	How defibrillators are different from pacemakers and describe the DC defibrillator type in detail.	CO1	PO2	**08**
	b)	Compare the different types of implantable pacemakers.	CO1	PO2	**12**

			OR			
	5	a)	Illustrate the working of programmable type of pacemakers with a neat block diagram and how are they different from other types.	*CO1*	*PO2*	**08**
		b)	Suggest the most suitable technique for Cardiac output measurements and explain its principle of working.	*CO1*	*PO3*	**07**
		c)	Discuss the operating procedure involved in spirometry.	*CO1*	*PO2*	**05**
			UNIT - IV			
	6	a)	Summarize the ethical issues to be followed for in the design of medical biomedical Instruments?	*CO2*	*PO8*	**06**
		b)	Discuss in general on the Electrical safety methods to be followed in medical equipment's.	*CO2*	*PO6*	**06**
		c)	What are Microwave diathermy and ultrasonic type and how are they different from therapeutic point of view.	*CO1*	*PO2*	**08**
			UNIT - V			
	7	a)	What type of patients can be treated using IPPB unit and explain in detail the Operating method involved for treatments.	*CO1*	*PO3*	**07**
		b)	Explain when it is required to use Heart-Lung machine and in detail discuss the five - Pump mechanism heads that might be used in heart lung machine	*CO1*	*PO1*	**08**
		c)	With a neat diagram explain the principle of dialysis in the artificial kidney.	*CO2*	*PO1*	**05**

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