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: VI**

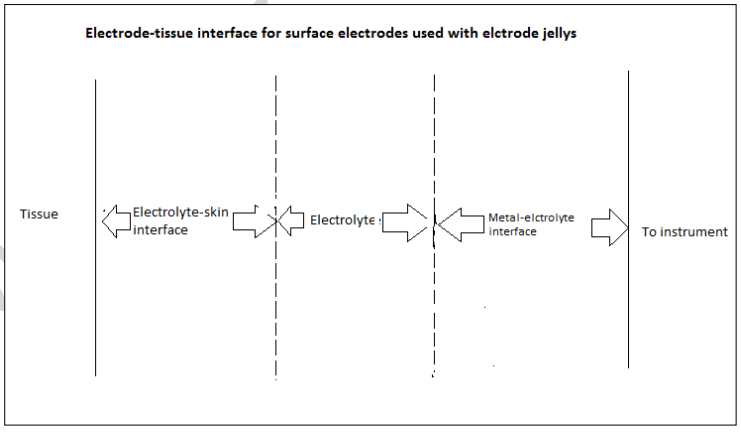
Branch: Electronics and Instrumentation Engineering **Duration: 3 hrs.**

Course Code: 23EI6PE2BI **Max Marks: 100**

Course: Biomedical Instrumentation

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)	"An action potential is a short-lasting event in which the electrical membrane potential of a cell rapidly rises and falls, following a consistent trajectory." With a neat labelled diagram Justify this statement.			**10**
	b)	Enumerate the Sources of Biomedical Signals and Explain Each in Detail.			**10**
		OR			
2	a)	Identify the following and discuss the phenomenon occurring at each interface. 			**10**
	b)	Compare and contrast surface and microelectrodes.			**05**
	c)	Give the classification of biomedical instruments.			**05**
		UNIT - II			
3	a)	Write a note on the following i) Motion artifacts ii) Biomedical signal conditioning			**10**
	b)	Sketch and explain the 10-20 electrode system.			**10**

			OR			
	4	a)	Discuss the need and different types of biomaterials used for electrodes.			**10**
		b)	Discuss the practical aspects involved in the selection, placement, and usage of biomedical electrodes for signal acquisition.			**10**
			UNIT - III			
	5	a)	The electrical activity of human heart is initiated at SA node. Explain with a neat diagram the genesis of ECG wave and give the clinical significance of QT, ST, PR and RR Interval.			**10**
		b)	Demonstrate the principle behind the working of laser Doppler blood flow meter.			**10**
			OR			
	6	a)	With relevant diagrams, Explain unipolar & bipolar limb lead configuration for the measurement of ECG.			**10**
		b)	Discuss the need of pacemakers and defibrillator.			**10**
			UNIT - IV			
	7	a)	What is multi-patient telemetry? Discuss its significance in hospital monitoring systems.			**08**
		b)	What is cyber medicine? Describe its features, benefits, and ethical challenges.			**06**
		c)	What are the key components of a telemedicine system? Illustrate with a block diagram.			**06**
			OR			
	8	a)	Describe implantable telemetry systems. What are the design considerations and challenges involved?			**08**
		b)	Differentiate between single-channel and multi-channel wireless telemetry systems with suitable examples.			**06**
		c)	Explain the methods used for transmission of real-time video images in telemedicine applications.			**06**
			UNIT - V			
	9	a)	What are the major challenges faced in modern hospital administration? How can they be addressed?			**10**
		b)	Explain the process of equipment planning in hospital design. Why is it critical for effective healthcare delivery?			**10**
			OR			
	10	a)	What is Medical Informatics? Discuss its role in improving clinical decision-making and healthcare delivery.			**10**
		b)	What is biomedical waste? Explain the regulatory guidelines and safety practices for biomedical waste management in hospitals.			**10**

****