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

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E. **Semester: VI**
Branch: Electronics and Instrumentation Engineering **Duration: 3 hrs.**
Course Code: 19EI6PE3BM **Max Marks: 100**
Course: Bio Medical Instrumentation **Date: 17.07.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Identify and explain any five general constraints in the design of medical instrumentation systems.	**10**
	b)	Compare and contrast any four types of surface electrodes used in ECG recording. Draw the equivalent circuit of a biopotential electrode.	**10**

OR

2	a)	With neat diagrams, illustrate the sequence of events associated with the action potential of a cell. Add a note on refractory period.	**10**
	b)	Differentiate between invasive and noninvasive electrodes. Draw the equivalent circuit of a biopotential electrode.	**10**

UNIT - II

3	a)	Differentiate bipolar leads and unipolar leads with neat sketches. Elaborate on the procedure of determining the cardiac vector. Draw and measure it.	**10**
	b)	Discuss the physiological effects of electric current on the human body.	**10**

UNIT - III

4	a)	Analyze the auscultatory method of BP measurement with neat waveforms and differentiate the technique with Palpatory method.	**10**
	b)	With a neat block diagram, interpret the working of an instrument to correct fibrillation.	**10**

OR

5	a)	Illustrate a technique to measure the blood flow based on Doppler shift and interpret its working with a neat sketch. Assess its limitations and advantages over other blood flow meters.	**10**
	b)	Identify the figure shown in Figure 5b and analyze the measurement technique.	**10**

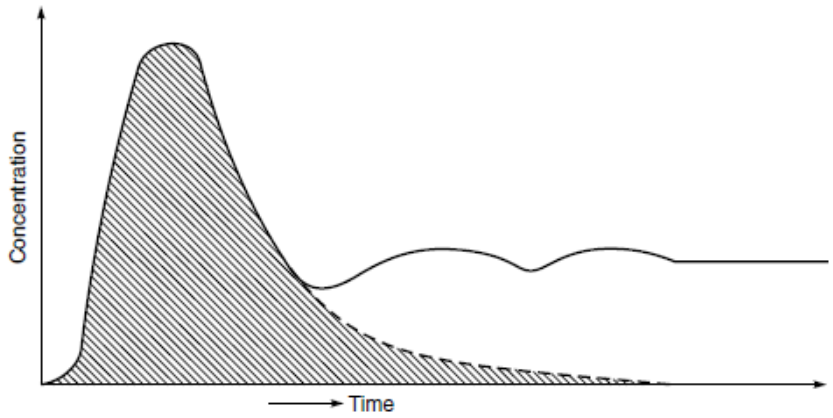

Figure 5b

UNIT - IV

6	a)	Illustrate the working of an instrument to record the electrical activity of the brain with a neat block diagram.	**10**
	b)	Assessment of the frequency and amplitude of the EEG is crucial for rapid and accurate interpretation. Propose the different waveform representing the activity of a human brain.	**10**

UNIT - V

7	a)	Draw the block diagram of a single channel telemetry system.	**10**
	b)	Identify and explain the principle employed in an implantable telemetry system with a neat block diagram.	**10**

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