U.S.N.										

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

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: MEDICAL ELECTRONICS ENGINEERING **Duration: 3 hrs.**
Course Code: 22MD3PCBSM **Max Marks: 100**
Course: Biomedical Sensors and Measurements

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)	State the 4 types of error and discuss them briefly.	**07**
	b)	Explain the following (i)Static characteristics (ii)Dynamic characteristics.	**08**
	c)	Discuss the classification of the instruments based on applications	**05**

UNIT - II

2	a)	What are Active and Passive sensors? Give examples.	**05**
	b)	How does capacitive displacement sensor work? Explain in brief.	**05**
	c)	How LVDT can be used for the measurement of Pressure.	**05**
	d)	On which parameter EEG waves are classified? Mention their typical range.	**05**

UNIT - III

3	a)	With relevant sketch explain the principle and working of thermocouple	**08**
	b)	What are Infrared radiation thermometers explain the principle of working with suitable sketches.	**08**
	c)	What is RTD and where it is used?	**04**

OR

4	a)	Explain with circuit diagram radio pill for core body temperature.	**08**
	b)	With schematic discuss about Zero-Heat flow thermometer.	**08**
	c)	Discuss briefly about units of thermal quantities.	**04**

UNIT - IV

5	a)	With schematic diagram explain the principle of the fluxgate Magnetometer.	**08**
	b)	Discuss the standard 10-20 electrode system in EEG measurements.	**08**
	c)	Discuss briefly silver-silver chloride electrode.	**04**

OR

6	a)	Discuss in detail Einthoven triangle and standard 12-Lead ECG system.	**10**
	b)	Explain the following:- (i)EMG Electrodes	**05**
		(ii)Dry Electrode	**05**

UNIT - V

7	a)	Draw the diagram for transition scheme in optical phenomena employed in spectrophotometric chemical measurements, explain the principle in detail.	**08**
	b)	Explain with schematic diagram of an ion-selective electrode and measurement system.	**08**
	c)	Provide brief information about Bio-Sensors.	**04**

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