U.S.N.										

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

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT5DE2BBI **Max Marks: 100**
Course: Biosensors and Bioinstrumentation

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)	Comment on static and dynamic characteristics of a transducer in detail.	**12**
	b)	Explain the principle, construction and working of piezoelectric transducer with a neat sketch.	**08**

OR

2	a)	Demonstrate a biomedical instrumentation system and its components with a general block diagram.	**08**
	b)	Write a short note on electrode-tissue interface with an interface diagram.	**06**
	c)	Give an account on principle and waveform of EMG.	**06**

UNIT - II

3	a)	Explain the principle and working of electromagnetic blood flow meter with a neat sketch.	**06**
	b)	Give an account on the origin and types of measurement of pulse rate.	**07**
	c)	What is a Pacemaker? Discuss on the different types of Pacemakers.	**07**

UNIT - III

4	a)	With a schematic diagram, explain the principle, construction and working of basic type of spirometer.	**08**
	b)	Comment on the different lung volumes and their capacities with a graphical representation.	**12**

UNIT - IV

5	a)	Mention the different classes of biosensor depending upon transducers, bioactive components and different types of interaction.	**12**
	b)	Give an account on BIA core optical biosensor with a schematic diagram.	**08**

UNIT - V

6	a)	With suitable illustrations, discuss the applications of nano-biosensors in medicine.	**08**
	b)	Demonstrate the working principle and applications of biosensors for heavy metal detection in an aquatic ecosystem.	**06**
	c)	Describe the role of biosensors in environmental applications.	**06**

OR

7	a)	Discuss the role of biosensors in personal diabetes management.	**10**
	b)	Demonstrate the steps involved in fabrication of MEMS.	**10**

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