

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18EI54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 Biomedical Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are biomedical signals? Explain the various sources of biomedical signals. (08 Marks)
- b. Describe the constraints to be considered in designing medical instrumentation system. (12 Marks)

OR

- 2 a. With equivalent circuits, explain metal-electrolyte interface. (08 Marks)
- b. How are silver-silver chloride electrodes prepared? (04 Marks)
- c. Describe the types of micro electrodes. (08 Marks)

Module-2

- 3 a. Give the block diagram description of ECG machine. (08 Marks)
- b. With figures, explain bipolar limb leads. (06 Marks)
- c. Discuss the effects of artefacts on ECG recordings. (06 Marks)

OR

- 4 a. Explain the computerized analysis of EEG. Give its waveforms. (10 Marks)
- b. With block diagram, explain the components of EMG recording system. Add a note on preamplifier circuit. (10 Marks)

Module-3

- 5 a. Explain the bedside patient monitoring system with block diagram. List its modular parts. (10 Marks)
- b. Define oximetry. Discuss the working principle and advantages of pulse oximetry. (10 Marks)

OR

- 6 a. With figures, explain the blood pressure measurement using oscillometric method. (10 Marks)
- b. Explain impedance pneumography and apnoea detectors. (10 Marks)

Module-4

- 7 a. Describe the principle of electromagnetic blood flow meter. (08 Marks)
- b. Explain the block diagram of Doppler shift blood flow meter. (06 Marks)
- c. Discuss the measurement of continuous cardiac output derived from the aortic pressure waveform. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. What are the basic requirements of an implantable pacemaker circuit? Explain the types of implantable pacemakers. (10 Marks)
- b. Explain DC defibrillator with schematic diagram and waveform of discharge pulse. (10 Marks)

Module-5

- 9 a. Describe the basic units in Hemodialysis machine. (08 Marks)
- b. Discuss the classifications of ventilators. Explain the instrumentation system for recording continuous positive-airway pressure. (12 Marks)

OR

- 10 a. Give the precautions to be taken to minimize electric shock hazards. (10 Marks)
- b. Explain the tests needed for checking safety parameters of biomedical equipments. (10 Marks)

* * * * *

VTU EXAMS JAN / FEB 2021