

Ref. No. : Ex/PG/BME/PC/T/112/2025

Master of Biomedical Engineering Examination 2025
(1st Year, 1st Semester)
Biomedical Instrumentation

Time: 3 hours

Full Marks: 100

Answer any five questions

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| Q-1) | Describe and explain with neat sketches the electroacoustical parameters for | 20 Marks |
| [CO1] | designing and performance evaluation of a hearing aid. | |
| Q-2) | Describe the transmitter and receiver sections of "Sonic Guide", the mobility aid | 20 Marks |
| [CO2] | for a blind person. Explain its operation. Include necessary sketches, block diagrams and circuit diagrams in your answer. | |
| Q-3) | Explain with block diagram how sensory feedback can be provided in a | 20 Marks |
| [CO3] | myoelectrically controlled upper extremity prosthesis. | |
| Q-4) (i) | How does a dc-defibrillator work? Explain with circuit diagram | 10 Marks |
| [CO2] | | |
| Q-4) (ii) | Mention different types of implantable pacemakers and explain the operation of | 10 Marks |
| [CO4] | each type briefly | |
| Q-5) (i) | Mention the parameters used for the evaluation of pulmonary function | 5 Marks |
| [CO5] | | |
| Q-5) (ii) | Discuss briefly about different types of heart sounds | 5 Marks |
| [CO4] | | |
| Q-5) (iii) | Explain with neat sketch the operation of volume limited ventilator | 10 Marks |
| [CO3] | | |
| Q-6) (i) | Describe and explain with neat sketches the method of measurement of arterial | 10 Marks |
| [CO5] | blood pressure using ultrasonic technique | |
| Q-6) (ii) | Describe and explain with neat sketches indicator dilution method for blood flow | 10 Marks |
| [CO5] | measurement | |
| Q-7) (i) | Describe and explain with neat sketches the operation of driven right leg lead | 10 Marks |
| [CO3] | configuration in an Electrocardiograph | |
| Q-7) (ii) | Draw Peak Detector circuit for the processing of ECG signal and explain the | 10 Marks |
| [CO2] | operation of the circuit briefly | |
| Q-8) (i) | Explain why leakage current is potentially dangerous | 5 Marks |
| [CO1] | | |
| Q-8) (ii) | Describe with neat sketches the different types of EEG recording modes | 15 Marks |
| [CO4] | | |