

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) (i) [CO3] | Explain with neat sketch how does a hearing aid operate | 10 Marks |
| Q-1) (ii) [CO5] | Explain Pure tone air conduction threshold testing method | 5 Marks |
| Q-1) (iii) [CO1] | Write short note on “Ambulation aids” | 5 Marks |
| Q-2) [CO2] | Describe any one Electronic Travel aid for a blind person. Explain its operation. Include necessary sketches, block diagrams and circuit diagrams in your answer. | 20 Marks |
| Q-3) [CO3] | Describe and explain with neat sketches the operation of a myoelectrically controlled upper extremity prosthesis | 20 Marks |
| Q-4) (i) [CO4] | Explain different types of fibrillations and extent of risk involved in each case | 5 Marks |
| Q-4) (ii) [CO5] | Briefly discuss the demerits of ac-defibrillation | 5 Marks |
| Q-4) (iii) [CO3] | Explain with neat sketch the operation of bell-jar mechanical spirometer | 10 Marks |
| Q-5) (i) [CO3] | Explain with neat diagrams the operation of servo-controlled ventilator | 10 Marks |
| Q-5) (ii) [CO1] | Discuss briefly on “Physiological effects of electrical current”. | 5 Marks |
| Q-5) (iii) [CO4] | Write in short about the classification of EEG frequency bands | 5 Marks |
| Q-6) (i) [CO3] | Explain with neat sketch how magnetic blood flow meter works. Why electromagnets are used instead of permanent magnets in such blood flow meters? | 10 Marks |
| Q-6) (ii) [CO4] | What is the type of waveform used to drive electromagnet in magnetic blood flow meters and why? Explain with sketches | 5 Marks |
| Q-6) (iii) [CO5] | Explain briefly a method of plethysmography | 5 Marks |
| Q-7) (i) [CO2] | Draw the circuit diagram of a biopotential amplifier and explain its operation | 10 Marks |
| Q-7) (ii) [CO4] | Discuss with neat sketches about different types of lead configurations in Electrocardiography | 10 Marks |
| Q-8) (i) [CO5] | Discuss about the different types of direct method of measurement of blood pressure | 15 Marks |
| Q-8) (ii) [CO3] | Explain the method of measurement of Ballistocardiogram | 5 Marks |