

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: M.Sc/IMSC
BRANCH: PHYSICS/ESM/MATHS**

**SEMESTER : II/VIII
SESSION : SP/2025**

SUBJECT: BT427 BIOMEDICAL EQUIPMENT AND DEVICES

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	What is ECG? Explain the 10 electrode 12 channel ECG recording system for vector electrocardiography.	[5]	CO CO1	BL Understand
Q.1(b)	What are the clinical importance of EEG in clinical evaluation and sleep-wake analysis.	[5]	CO2	Understand
Q.2(a)	Illustrate the block diagrams of analog and digital ECG recorder and explain the function of each of these blocks.	[5]	CO5	Remember
Q.2(b)	Explain the instrumentation and function of sphygmomanometer and pulse oximeter system.	[5]	CO2	Analyze
Q.3(a)	Illustrate the instrument and functional applications of defibrillator. What are the advantages of DC defibrillators over AC defibrillators.	[5]	CO4	Remember, Evaluate
Q.3(b)	What are the types of artificial pacemakers? Explain the functions of on-demand artificial implantable pacemakers.	[5]	CO3	Understand
Q.4(a)	Write notes on functions and applications of blood pumps and intra-aortic balloon pump.	[5]	CO2	Remember
Q.4(b)	Write an essay on how biomedical devices play an important role in surgery.	[5]	CO5	Apply
Q.5(a)	What are the semi and fully automatic biochemical analyzers and what are their operational principles?	[5]	CO2	Understand
Q.5(b)	Explain how spectrophotometric techniques can be applied for the analysis of biomedical fluids?	[5]	CO5	Apply

:25/04/2025:::E