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

CLASS: B.Tech **SEMESTER : VI**
BRANCH: Biotechnology **SESSION : SP/2024**

SUBJECT: **BE319 BIOELECTRONICS- CONCEPT AND INSTRUMENTATION**

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.

			CO	BL
Q.1(a)	Explain the physiology of cardiac system with respect to blood circulation in the body. Correlate the cardiac electrical, hemodynamic and acoustic information in one complete cardiac cycle.	[5]	CO1	Understand
Q.1(b)	What is action potential? Explain the complete ionic mechanism of generation of an action potential in large nerve fiber.	[5]	CO1	Remember
Q.2(a)	Classify the types of biomedical signals and provide a suitable example for each of them. Write the signal characteristics of ECG, EMG and EEG waves.	[5]	CO2	Analyze
Q.2(b)	With suitable block diagram, explain the function of the EEG recording system.	[5]	CO2	Apply
Q.3(a)	Illustrate the important components of the 'Heart-Lung Machine'. Explain its application and function during the open heart surgery.	[5]	CO2	Apply
Q.3(b)	Draw the diagram of natural pace making system of the heart. Classify the types of artificial pacemakers assisting the heart during the failure of natural pacemakers.	[5]	CO2, CO3	Apply
Q.4(a)	What is X-ray? How is this generated and applied for biomedical imaging? Write a short note on the X-ray hazards.	[5]	CO2, CO4	Understand
Q.4(b)	Explain the principle of function of CT scan machine and its progressive development in generations.	[5]	CO2	Remember
Q.5(a)	Explain the application of the concept of modulation and demodulation in biomedical telemetry system.	[5]	CO3, CO5	Analyse
Q.5(b)	Illustrate the components and working principle of a multichannel wireless telemetry system.	[5]	CO3, CO5	Apply

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