

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION SP2023)

CLASS: BTECH  
BRANCH: BIOTECH

SEMESTER : IV  
SESSION : SP2023

SUBJECT: BE215R1 CELLULAR ELECTROPHYSIOLOGY  
TIME: 02 Hours

FULL MARKS: 25

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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		CO	BL
Q.1(a)	Write note on different types of cellular transport mechanism.	[2]	CO1 Remember
Q.1(b)	Draw the waveforms that can be generated by the Na and K ions independently.	[3]	CO1 Understand
Q.2(a)	Write the concentration differences of Na, K and Cl ions between the intracellular and extracellular environment of the cell.	[2]	CO1 Remember
Q.2(b)	Draw and label the components of a classical waveform of action potential generated in the large nerve fiber.	[3]	CO1 Understand
Q.3(a)	Write and explain the Fick's law of diffusion.	[2]	CO2 Understand
Q.3(b)	Write and explain the Ohm's law for drift and Einstein's relation between ionic drift and mobility.	[3]	CO2 Understand
Q.4(a)	Explain the mechanism of active transport of ions across the plasma membrane.	[2]	CO2 Remember
Q.4(b)	Write notes on different types of active transport mechanism available in the plasma membrane.	[3]	CO2 Remember
Q.5(a)	Derive the Nernst Plank equation.	[2]	CO2 Understand
Q.5(b)	Write the Nernst equation and explain how it is important in calculation of emf generated due to passive transport of ions.	[3]	CO4 Analyze

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