Total No. of Printed Pages: 2

PRN No.	

PAPER CODE	U325-294D CE

(AY:2024-25) May 2025 (ENDSEM) EXAM

T.Y.Btech (SEMESTER - II)

COURSE NAME: Biomedical Instrumentation Branch: E&TC COURSE CODE: ETUA32204D

(T.Y PATTERN 2020R1)

Time: [1Hr 30 Min] **[Max. Marks: 40]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks. Use of scientific calculator is allowed**
2) **Use suitable data wherever required**
3) **All questions are compulsory. Solve any two sub question each from Questions 1, 2 ,3 and 4**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Explain Polarization, depolarization, Repolarization, absolute refractory period, relative refractory period for a Bio Cell. What is the value of Polarization Potential? What is the value of action potential?	[5]	[1]	[2]
	b) Explain various transducers (biomedical electrodes) used in acquisition of ECG/EEG or EMG	[5]	[1]	[2]
	c) Explain different types of biomedical signals and its sources of origin.	[5]	[1]	[2]
Q2	a) Draw a neat labeled diagram of ECG waveform with their amplitudes and time duration. Explain the significance of PR interval, QRS complex, ST segment in diagnosing ECG waveform.	[5]	[2]	[2]
	b) With a help of block diagram explain the ECG recorder	[5]	[2]	[2]
	c) Draw and explain the lead configurations in ECG acquisition system.	[5]	[2]	[2]
Q3	a) List the 4 different types of EEG signals. Explain the significance of the EEG signals.	[5]	[3]	[2]
	b) Why are EEG signals analyzed in frequency domain. How EEG analysis can help in diagnosing sleep apnea disorders.	[5]	[3]	[2]
	c) Draw and explain 10-20 electrode placements for acquisition of EEG.	[5]	[3]	[2]

Q4	a) Mention the types of pacemakers and explain implantable pacemaker.	[5]	[4]	[2]
	b) Explain why isolation is required in biomedical systems that acquire electrical signals generated from human body. Explain any one isolation technique	[5]	[4]	[2]
	c) Draw and explain the significance of right leg drive circuit in ECG amplifier.	[5]	[4]	[2]

** Blooms Taxonomy level 2-Understanding, 3-Apply