BACHELOR OF ENGINEERING (ELECTRICAL ENGINEERING) 5TH YEAR 2ND SEMESTER SUPPLEMENTARY EXAMINATION, 2023

SUBJECT: - BIOMEDICAL INSTRUMENTATION

Time: **Three hours**

Full Marks 100
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions	PART- I	Marks
	Answer question no.-1 and any TWO from rest.	
1.	What do you mean by (any FOUR) (a) Refractory period (b) Saltatory conduction (c) Stimulus (d) Transduction in a cell (e) Action potential (f) Ion channel and Ion pump	4X5=20
2.	Explain with appropriate diagram(s) the process of generation and propagation of Action Potentials within neurons.	15
3.	Illustrate with appropriate schematic diagram the patch clamp technique. What is the purpose of using such technique?	15
4.	What are the different types of leads used in collecting ECG waveform? Show with appropriate diagram the method of using them.	15

Ref No: ***Ex/EE/5/T/523D/2023(S)***

B.E. (ELECTRICAL ENGG.) 5TH YEAR 2ND SEMESTER SUPPLEMENTARY EXAMINATION, 2023

SUBJECT: - BIO-MEDICAL INSTRUMENTATION

Time: Three hours **Full Marks 100**
(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions	PART-II	Marks
	Answer any four, 2 marks for well organized answers	
	Answer any 4 (12X4=48)	
1.	What are the different types of noises which play significant roles in biomedical instrumentation? Explain different methods for elimination of such noises. Explain various shielding strategies in this context.	6+6
2.	A two dimensional biomedical data is shown in the table given below. Two dimensions are taken as x and y. Physical significance of each dimension is not disclosed. Find and choose a suitable principal component for the data set to reduce its dimension. Show the modified data.	12
3.	What are the importances of pulse oximetry? Explain the basic principle of optical absorption difference based oximetry. Describe a suitable signal amplifier for this application with explanations.	2+6+4
4.	Explain oscillometric and auscultatory methods of blood pressure measurement with necessary diagrams.	12
5.	**Write short notes on the following topics**	6+6
a)	Computed (Axial) Tomography	
b)	Impedance plethysmography	

x	y
6	5
4	2
8	6
10	7
12	8
14	10
5	4
9	6
7	5
10	8