Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 80015

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024
Fifth Semester
Electrical and Electronics Engineering
U19EEV34 - BIO MEDICAL INSTRUMENTATION
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Why does a cell have a negative charge inside at the resting potential?	2	K2	CO1
2.	Name the components of a biomedical system.	2	K1	CO1
3.	What are the sounds of Korotkoff and what causes them?	2	K3	CO2
4.	Name atleast two factors which regulate pH of human blood.	2	K2	CO2
5.	Name the electrodes used for EEG measurement.	2	K3	CO3
6.	Draw an ECG waveform and label its constituent parts.	2	K2	CO3
7.	List at least two applications of endoscopy.	2	K2	CO4
8.	List two advantages of an MRI scan.	2	K3	CO4
9.	State two disadvantages of a defibrillator.	2	K1	CO5
10.	Why is an implanted pacemaker used for a patient?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the functioning of the central nervous system. Where is it located? Why are nerves so important to our body?	13	K3	CO1

(OR)

	b)	i. Define a transducer. What are the applications of Piezoelectric transducers in bio-medical domain?	7	K2	CO1
		ii. Explain the different techniques used for measuring human body temperature.	6		
12.	a)	Detail the operation of an automated electro sphygmomanometer for blood pressure measurement.	13	K3	CO2
		(OR)			
	b)	Explain the automatic and semiautomatic methods of measuring blood pressure in detail.	13	K2	CO2
13.	a)	i. What is a Differential amplifier and how is it used in biomedical applications?	7	K2	CO3
		ii. Explain the working of an instrumentation amplifier.	6		
		(OR)			
	b)	Explain in detail the ECG lead system, the recording methods and waveform.	13	K2	CO3
14.	a)	What is multi-channel bio-telemetry system? Explain its working with the help of a block diagram.	13	K3	CO4
		(OR)			
	b)	Discuss the working principle of endoscopy with the aid of a block diagram.	13	K1	CO4
15.	a)	What is heart-lung machine? Discuss with the help of a block diagram.	13	K1	CO5
		(OR)			
	b)	i. Explain briefly ICCU Patient Monitoring System.	7	K2	CO5
		ii. Explain briefly the role of nano robots in robot surgeries.	6		

PART – C

(1 x 15 = 15 Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)	i.	Explain Einthoven triangle and describe how ECG lead configurations are employed.	8	K2	CO3
		ii.	Explain the construction and working of skin surface electrode.	7		
			(OR)			
	b)	i.	Explain the structure of human cell and its constituents with the help of neat diagram.	7	K2	CO1
		ii.	Explain the characteristics of resting potential with reference to Nernst equation.	8		