BME

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: 120018

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024
Third Semester
Biomedical Engineering
U19BM302 – BIO SENSORS AND MEASUREMENT DEVICES
(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.	Define accuracy of an instrument.	2	K1	CO1
2.	Classify the different types of instruments.	2	K2	CO1
3.	Define Strain Gauge.	2	K1	CO2
4.	List out the factors considered while selecting a transducer.	2	K1	CO2
5.	Recall the different types of Photoelectric transducers.	2	K1	CO3
6.	Find the applications of Optical biosensor.	2	K1	CO3
7.	List the functions of passive filters.	2	K1	CO4
8.	What is the use of bridge circuits?	2	K2	CO4
9.	List the parameters that can be measured using DSO.	2	K1	CO5
10.	How the effect of nonlinear behavior is avoided in true RMS voltmeter?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the errors and the methods used for their analysis in the measurement systems.	13	K2	CO1
		(OR)			
	b)	Discuss about the performance characteristics that should be considered when selecting a transducer for biomedical applications.	13	K2	CO1
12.	a)	Explain working principle of LVDT and state advantages and disadvantages of LVDT.	13	K2	CO2
		(OR)			
	b)	Explain the construction of strain gauges and derive the expression for gauge factor.	13	K2	CO2
13.	a)	Describe the working & application of the Photoconductive cells in detail.	13	K2	CO3
		(OR)			
	b)	Explain the working principle of optical sensors for measurement of blood glucose level.	13	K2	CO3
14.	a)	Describe with Schering bridge for the measurement of unknown value of capacitance.	13	K3	CO4
		(OR)			
	b)	Analyse the importance of signal conditioning in measurement systems.	13	K3	CO4
15.	a)	Analyse the use of an PMMC writing system, describe how to record an ECG signal.	13	K3	CO5
		(OR)			
	b)	Identify the different blocks of CRO and explain it in detail.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Identify static characteristics of instruments and explain at least six static characteristics.	15	K3	CO1
		(OR)			
	b)	Analyse the importance & characteristics of various types of radiation detectors.	15	K3	CO3