

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

Biomedical Engineering

BM3301 – Sensors and Measurement

Regulations – 2021

Duration: 3 Hrs

Maximum: 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	A thermometer is calibrated from 150°C to 300°C. The accuracy is specified as $\pm 0.2\%$ of span. What is the maximum static error?	AP	1	2
2.	List the various types of standards.	RE	1	2
3.	Define gauge factor.	RE	2	2
4.	Label the thermistor characteristic.	RE	2	2
5.	Compare Sensor and transducers.	UN	3	2
6.	Classify the piezoelectric transducers.	UN	3	2
7.	Compare active and passive filters.	UN	4	2
8.	Define preamplifier.	RE	4	2
9.	List the application of magnetic tape recorder.	RE	5	2
10.	Show the block diagram of Cathode ray oscilloscope.	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a i Illustrate in detail about primary and secondary standards.	UN	1	7
	ii Contrast the various classifications of Active and passive transducers.	UN	1	6
	Or			
b	Show the following terms in the context of normal frequency distribution of data (a) Mean Value, (b) Deviation, (c) Average deviation, (d) Variance.	UN	1	13
12.	a i Explain in detail about working of thermocouple and its applications.	UN	2	7
	ii Summarize the working of thermistor with neat sketch.	UN	2	6
	Or			
b i	Explain in detail about structure of LVDT and its operation.	UN	2	7
	ii Illustrate the basic structure of strain gauge.	UN	2	6
13.	a Contrast the principle and operation of photo conductive cell and photo voltaic cell.	AP	3	13
	Or			
b	Explain the principle and operation of Piezoelectric transducer.	AP	3	13

14.	a	Develop wheat stone bridge and derive the bridge balancing equation, with neat sketch.	AP	4	13
		Or			
	b	Model the construction and working of PMMC instrument. Derive the equation for deflection if the instruments are spring controlled.	AP	4	13
15.	a i	Explain the working of a Digital Multimeter with neat sketch.	UN	5	7
	ii	Infer the working of Light emitting display.	UN	5	6
		Or			
	b i	Illustrate the construction and working of inkjet recorder.	UN	5	7
	ii	Outline the working of Liquid crystal display.	UN	5	6

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Inference the working of a Digital storage oscilloscope with neat sketch and list the measuring parameters.	AN	5	15
		Or			
	b	Examine the working of biosensor electronic nose with neat sketch.	AN	5	15