Reg. No.															

Question Paper Code	13604

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fourth Semester

Electrical and Electronics Engineering

20EEPC403 - MEASUREMENTS AND INSTRUMENTATION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Range of an instrument is _____ (a) The minimum value that can be measured (b) The maximum value that can be measured (c) All values starting from the minimum to the maximum that can be measured (d) The average of all values that can be measured	1	K1	CO1
2.	In an experiment, it is found that the experimental value is very close to actual value, hence the experimental value can be called _____ (a) Accurate (b) Precise (c) Suitable (d) Mean	1	K1	CO1
3.	Current is converted to voltage _____ (a) through a voltmeter (b) through a resistance (c) through an ammeter (d) through a galvanometer	1	K1	CO2
4.	Creeping is avoided by _____ (a) reversing the polarity of the voltage (b) drilling two diametrically opposite holes (c) holding the disc (d) increasing the friction	1	K1	CO2
5.	What is the condition to achieve a high sensitivity in a Kelvin bridge? (a) low voltage (b) high power (c) medium resistance (d) high current	1	K1	CO3
6.	Bridge balance equations are _____ (a) easy to derive (b) independent of the components (c) complex in nature (d) real in nature	1	K1	CO3
7.	The Pipe earthing can be regulated by _____ (a) Replacing the conductor (b) adding the copper rod (c) adding salt and water (d) replacing the earthing rod	1	K1	CO4
8.	Any conductor carrying electrical current has an associated _____ (a) resistive field (b) electrical field (c) magnetic field (d) capacitive field	1	K1	CO4
9.	Which of the following instruments can show time-domain representation of an electrical signal? (a) Spectrum analyzer (b) Signal generator (c) Oscilloscope (d) Power meter	1	K1	CO5
10.	A transducer must have great _____ for sustained operations. (a) Accuracy (b) Cross Sensitivity (c) Stability **(**d) Sensitivity	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Define resolution and precision.	2	K1	CO1
12.	Compare Reproducibility and Repeatability.	2	K2	CO1
13.	Illustrate the term of creeping.	2	K2	CO2
14.	Outline the circuit of the electrodynamometer wattmeter.	2	K2	CO2
15.	Summarize the conditions for AC Bridge to be balanced.	2	K2	CO3
16.	Write the applications of DC potentiometer.	2	K1	CO3
17.	What are the main causes for ground loop currents?	2	K1	CO4

18.	What is meant by grounding?		*2*	*K1*	*CO4*
19.	Distinguish between the Printers and Plotters.		*2*	*K2*	*CO5*
20.	What is PQ analyzer?		*2*	*K1*	*CO5*
21.	Give any two applications of Smart sensors.		*2*	*K1*	*CO6*
22.	Outline the factors to be considered for selection of transducers.		*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the functional elements of an instrument with a neat block diagram and example.	*11*	*K2*	*CO1*
		OR			
	b)	A set of independent current measurements were taken by 6 observers and recorded as 12.8 A, 12.2 A, 12.5 A, 13.1 A, 12.9 A, 12.4 A. Find: Arithmetic Mean, Deviation, Average Deviation, Standard Deviation, and Variance.	*11*	*K2*	*CO1*
24.	a)	With a neat diagram explain the construction and its working principle of single-phase electrodynamometer type wattmeter. Also derive its torque equation.	*11*	*K2*	*CO2*
		OR			
	b)	How is Analog multi-meter used to measure different parameters? Explain.	*11*	*K2*	*CO2*
25.	a)	Draw a neat sketch of modern slide wire D.C potentiometer and discuss how the potentiometer is standardized.	*11*	*K2*	*CO3*
		OR			
	b)	Derive the equation of balance for an Anderson bridge. Draw the phasor diagram for conditions under balance.	*11*	*K2*	*CO3*
26.	a)	Explain about electrostatic and electromagnetic interference.	*11*	*K2*	*CO4*
		OR			
	b)	Describe in detail about.			
		(i) Multiple Earth and Earth loops	*6*	*K2*	*CO4*
		(ii) Grounding techniques	*5*	*K2*	*CO4*
27.	a)	What is a data logger? Explain the components in a data logger. List the functions of data Logger.	*11*	*K2*	*CO5*
		OR			
	b)	Draw and explain the block diagram of CRO.	*11*	*K2*	*CO5*
28.	a)	Write in detail about the construction and working of LVDT. List the applications of LVDT.	*11*	*K2*	*CO6*
		OR			
	b)	Write detailed note on smart sensors. Explain also the various built in feature of them compared to conventional sensor.	*11*	*K2*	*CO6*