Reg. No.																

Question Paper Code	13049

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Fourth Semester

Electrical and Electronics Engineering

20EEPC403 - MEASUREMENTS AND INSTRUMENTATION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following is a dynamic characteristic of an instrument? (a) Accuracy (b) Precision (c) Damping (d) None of the mentioned	1	K1	CO1
2.	In statistical evaluation of measurement data, which measure gives an idea of the average error in a data set? (a) Mean (b) Standard deviation (c) Median (d) Mode	1	K1	CO1
3.	Which of the following is NOT considered a standard used in calibration? (a) Primary standard (b) Secondary standard (c) Tertiary standard (d) Operational standard	1	K1	CO1
4.	Instrument transformers, such as current and voltage transformers, are used for: (a) Direct measurement of high voltages and currents (b) Insulation of measurement devices from high voltage circuits (c) Measuring power losses in transmission lines (d) Generating magnetic fields for testing	1	K1	CO2
5.	Which of the following devices is used to measure electrical energy consumption in homes? (a) Wattmeter (b) Energy meter (c) Frequency meter (d) Phase meter	1	K1	CO2
6.	Which of the following instruments is commonly used to measure frequency in an AC circuit? (a) Wattmeter (b) Frequency counter (c) Voltmeter (d) Power factor meter	1	K1	CO2
7.	In the Anderson Bridge, which additional component is used compared to the Maxwell Bridge to measure inductance? (a) Resistor (b) Capacitor (c) Transformer (d) Mutual inductance	1	K1	CO3
8.	The Kelvin Double Bridge is particularly useful for measuring: (a) High resistances (b) Low resistances (c) Capacitances (d) Inductances	1	K1	CO3
9.	Which bridge is preferred for high-frequency applications to measure capacitance and dielectric loss? (a) Wheatstone Bridge (b) Anderson Bridge (c) Schering Bridge (d) Maxwell Bridge	1	K1	CO3
10.	The primary purpose of electromagnetic screening in electrical systems is to _____ (a) enhance signal strength (b) block electromagnetic interference (EMI) (c) increase resistance (d) reduce heat generation	1	K1	CO4
11.	What is a potential problem caused by multiple earth points in an electrical system? (a) Voltage drop (b) Ground loop interference (c) Increased capacitance (d) Reduced current flow	1	K1	CO4
12.	What is the main advantage of single-point grounding in reducing ground loop issues? (a) It reduces the impedance of the grounding system (b) It eliminates potential differences between multiple earth points (c) It increases the signal strength in the circuit (d) It improves electromagnetic shielding	1	K1	CO4

13.	_____ is used for high-precision graphical output in engineering and design applications. (a) Digital Printer (b) LED Display (c) CRT Display (d) Digital Plotter	*1*	*K1*	*CO5*
14.	Which component of a Cathode Ray Tube (CRT) display is responsible for emitting electrons? (a) Deflection plates (b) Phosphor screen (c) Electron gun (d) Control grid	*1*	*K1*	*CO5*
15.	Which of the following devices can capture and store digital signals for future analysis in electronic systems? (a) PQ Analyzer (b) Digital Storage Oscilloscope (DSO) (c) Digital Plotter (d) Data Logger	*1*	*K1*	*CO5*
16.	_____technology is known for having high contrast and low power consumption, making it ideal for portable devices? (a) CRT b) LCD (c) Plasma (d) LED	*1*	*K1*	*CO5*
17.	Which of the following is an element of a data acquisition system? (a) Signal conditioning (b) Data storage devices (c) Both a) and b) (d) None of the mentioned	*1*	*K1*	*CO6*
18.	Which type of transducer uses a magnetic field to generate a voltage proportional to the physical quantity being measured? (a) Piezoelectric transducer (b) Hall effect transducer (c) Optical transducer (d) Digital transducer	*1*	*K1*	*CO6*
19.	Thermocouple are primarily used for measuring_____ (a) Temperature (b) Force and pressure (c) Magnetic fields (d) Displacement	*1*	*K1*	*CO6*
20.	Thermal imagers are primarily used to measure: (a) Light intensity (b) Temperature distribution across surfaces (c) Magnetic fields (d) Sound waves	*1*	*K1*	*CO6*

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21.	What is percentage error?	*2*	*K1*	*CO1*
22.	Compare accuracy and precision.	*2*	*K2*	*CO1*
23.	What is creeping?	*2*	*K1*	*CO2*
24.	Why is aluminium disc used in induction type energy meters?	*2*	*K1*	*CO2*
25.	List various detectors used in AC Bridge.	*2*	*K1*	*CO3*
26.	Define the term Standardization of potentiometer.	*2*	*K1*	*CO3*
27.	What are the sources of electromagnetic interference?	*2*	*K1*	*CO4*
28.	What is electrostatic shielding?	*2*	*K1*	*CO4*
29.	Compare Printers and Plotters.	*2*	*K2*	*CO5*
30.	What is smart sensor?	*2*	*K1*	*CO6*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31.	a)	Explain the static characteristics of an instrument in detail.	*10*	*K2*	*CO1*
		OR			
	b)	Summarize with a neat diagram the integrating type digital voltmeter and ramp type digital voltmeter.	*10*	*K2*	*CO1*
32.	a)	Explain the construction and its working principle of single-phase electrodynamometer type wattmeter with the help of neat diagram.	*10*	*K2*	*CO2*
		OR			
	b)	Illustrate how Analog multi-meter is used to measure different parameters.	*10*	*K2*	*CO2*

33.	a)	Construct the circuit of Wheatstone bridge, explain its operation and derive the equation for the unknown resistance.	*10*	*K3*	*CO3*
		OR			
	b)	Construct an Anderson bridge circuit and draw the phasor diagram for conditions under balance.	*10*	*K3*	*CO3*
34.	a)	Explain about electrostatic and electromagnetic interference.	*10*	*K2*	*CO4*
		OR			
	b)	Outline the various grounding techniques.	*10*	*K2*	*CO4*
35.	a)	Explain the block diagram of CRO.	*10*	*K2*	*CO5*
		OR			
	b)	Describe the construction and working of LCD's and illustrate about the light scattering and field effect types of LCD's.	*10*	*K2*	*CO5*
36.	a)	Summarize in detail the working of Digital transducers. Mention its advantages.	*10*	*K2*	*CO6*
		OR			
	b)	Explain the operation of any one type of passive transducer.	*10*	*K2*	*CO6*