Reg. No.															

Question Paper Code	14588

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Third Semester

Electronics and Instrumentation Engineering

24EIPC301 - ELECTRICAL MEASUREMENTS AND SENSORS

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART – A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	What is the primary application of the Schering bridge? a) Measuring inductance b) Measuring capacitance and dielectric loss c) Measuring resistance d) Measuring frequency	1	K1	CO1
2.	Which of the following resistances is considered a medium resistance in the context of a Wheat stone bridge? a) Less than 1 ohm b) 1 ohm to 100 ohms c) 100 ohms to 1 Mega ohm d) Greater than 1 Mega ohm	1	K2	CO1
3.	How can a moving coil instrument be adapted to measure AC signals? a) By increasing the coil resistance b) By using a rectifier to convert AC to DC c) By increasing the coil inductance d) By changing the permanent magnet	1	K3	CO1
4.	What is the primary purpose of LPF wattmeter? a) Measuring high power factor loads b) Measuring low power factor loads c) Measuring high-frequency signals d) Measuring direct current	1	K1	CO2
5.	Which type of damping is used in an electrodynamometer? a) Air friction damping b) Fluid damping c) Eddy current damping d) Spring damping	1	K2	CO2
6.	In an induction-type energy meter, Identify the component is responsible for generating the magnetic field? a) The aluminum disc b) The braking magnet c) The current coil and voltage coil d) The register	1	K3	CO2
7.	What is the primary function of a wave analyzer? a) Measure the voltage of a signal b) Measure the frequency of a signal c) Analyze the harmonic components of a signal d) Generate a sine wave	1	K1	CO3
8.	Basic building blocks of digital multimeter are a) oscillator, amplifier b) diode, op amp c) rectifier, Schmitt trigger d) A/D, attenuator, counter	1	K2	CO3
9.	A DC potentiometer is designed to measure up to about 2V with a slide wire of 800 mm. A standard cell of emf 1.18 V obtains balances at 600 mm. A test cell is seen to obtain balance at 680 mm. The emf of test cell is a) 1 V b) 1.34 V c) 1.5 V d) 1.05 V	1	K3	CO3

10.	The basic unit of magnetic flux density is		1	K1	CO4
	a) tesla	b) farad			
	c) volt per meter	d) Henry			
11.	Which of the following is the unit of a plane angle?		1	K2	CO4
	a) Radian	b) Steradian			
	c) Siemens	d) Newton			
12.	Limiting errors are also inferred as		1	K3	CO4
	a) Random errors	b) Static Errors			
	c) Guarantee errors	d) Probable errors			
13.	The overall operating range of the transducer is called?		1	K1	CO5
	a) Off-set	b) Drift			
	c) Span	d) Range			
14.	The time taken by the output to fall from 90% to 10% of the final value is		1	K3	CO5
	a) Rise time	b) delay time			
	c) storage time	d) Fall time			
15.	The principle of operation of LVDT is based on the vibration of		1	K2	CO6
	a) Self inductance	b) Mutual inductance			
	c) Reluctance	d) Permeance			
16.	The materials preferred for the elastic member in capacitive pressure transducer is		1	K3	CO6
	a) Inconel	b) Ni-Span C			
	c) Stainless Steel diaphragm or metal coated quartz	d) All of the mentioned			

PART – A (ii) (Short Answer Questions)
(6 × 3 = 18 Marks)
Answer ALL Questions

17.	Organize the different problems associated with measurement of low resistance.		3	K3	CO1
18.	Identify the purpose of a brake magnet in an energy meter.		3	K3	CO2
19.	Apply the basic working principle of LCR meters.		3	K3	CO3
20.	Analyze the functional block diagram of a measurement system and inference it.		3	K4	CO4
21.	Compare accuracy and precision.		3	K4	CO5
22.	Categorize the applications of LVDT.		3	K4	CO6

PART - B (Descriptive Answer Questions)
(6 × 11 = 66 Marks)
Answer ALL Questions

23.	a)	Construct in detail with neat illustration and the working principle of moving coil meters and compare with moving iron meters.	11	K3	CO1
		OR			
	b)	Develop the circuit diagram of Maxwell Capacitance bridge. Derive and analyze the equations for resistive and inductive components of the inductor to be measured.	11	K3	CO1
24.	a)	Apply the working principle of single phase induction type energy meter in any applications and construct it.	11	K3	CO2
		OR			
	b)	Experiment with the construction and working of Electrodynamometer wattmeter.	11	K3	CO2

25.	a)	Draw and analyze the circuit diagram of Crompton's potentiometer and explain its working. Describe the steps used when measuring an unknown voltage.	*11*	*K4*	*CO3*
		OR			
	b)	Sketch and examine the circuit diagram of Wave analyzers and its types in detail.	*11*	*K4*	*CO3*
26.	a)	Classify the transducers based on different characteristics.	*11*	*K4*	*CO4*
		OR			
	b)	Classify standards and give examples for each level of standard.	*11*	*K4*	*CO4*
27.	a)	Build the time response of a second order critical damped measuring system for a unit step input. Draw the response.	*11*	*K3*	*CO5*
		OR			
	b)	Organize the different static characteristics of transducer with an example.	*11*	*K3*	*CO5*
28.	a)	Construct the working principle of capacitive transducer.	*11*	*K3*	*CO6*
		OR			
	b)	Define gauge factor and Identify the different types of strain gauges with its applications.	*11*	*K3*	*CO6*