Reg. No.															

Question Paper Code	13880

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Third Semester

Electronics and Instrumentation Engineering

20EIPC301 - ELECTRICAL AND ELECTRONIC MEASUREMENTS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	What is the primary use of a PMMC instrument? (a) To measure frequency (b) To measure resistance (c) To measure DC current and voltage (d) To measure AC current and voltage	1	K1	CO1
2.	What is the function of the hairsprings in a moving coil instrument? (a) To support the moving coil (b) To provide damping to the system (c) To provide restoring torque and maintain zero position (d) To increase the sensitivity of the instrument	1	K1	CO1
3.	Which type of damping is used in an electrodynamometer? (a) Air friction damping (b) Fluid damping (c) Eddy current damping (d) Spring damping	1	K1	CO2
4.	Which communication technology is commonly used by smart meters to transmit data? (a) Infrared (b) Bluetooth (c) Zigbee (d) Radio frequency	1	K1	CO2
5.	Basically, a potentiometer is a device for (a) comparing two voltages (b) measuring a current (c) comparing two currents (d) measuring a voltage	1	K1	CO3
6.	Which type of instrument transformer is commonly used to measure high currents? (a) Current transformer (CT) (b) Potential transformer (PT) (c) Both CT and PT (d) Neither CT nor PT	1	K1	CO3
7.	Which of the following devices is often used in a wave analyzer to convert frequency components into a readable format? (a) Multimeter (b) Microphone (c) Rectifier (d) Phase-locked loop	1	K1	CO4
8.	Which of the following signals are generated by Wien-bridge oscillators? (a) Square wave (b) Sine wave (c) Triangular wave (d) Pulse wave	1	K1	CO4
9.	Which part is called as heart of Cathode Ray Oscilloscope? (a) CRT (b) Sweep generator (c) trigger circuit (d) Amplifier	1	K1	CO5
10.	In a common cathode seven-segment display, what voltage is required on the segment pins to turn them on? (a) Positive voltage (b) Negative voltage (c) Zero voltage (d) Any voltage	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Illustrate the methods used for measuring low resistances.	2	K2	CO1
12.	Compare and contrast the moving iron and electrodynamometer type meters.	2	K2	CO1
13.	Mention the purpose of copper shading bands in induction type wattmeter.	2	K1	CO2
14.	Define phantom loading.	2	K1	CO2
15.	Define voltage ratio box.	2	K1	CO3
16.	State the nominal ratio for a current transformer and turns ratio for a potential transformer.	2	K1	CO3
17.	Outline the advantages of digital instruments over analog instruments.	2	K2	CO4
18.	Compare the Ramp type DVM with Dual ramp type DVM.	2	K2	CO4

19.	Describe the working principle of a chart Recorder.		*2*	*K2*	*CO5*
20.	Explain the working principle of a Data Logger.		*2*	*K2*	*CO5*
21.	Define Q-Factor.		*2*	*K1*	*CO1*
22.	Explain how the deflection sensitivity of CRT affects its performance.		*2*	*K2*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Derive the torque equation for a Permanent Magnet Moving Coil(PMMC) instrument. Show that its scale is linear if spring control is employed and list out the advantages.	*11*	*K2*	*CO1*
		OR			
	b)	Discuss the measurement of resistance using Kelvin's double bridge method and obtain the expression for the unknown resistance.	*11*	*K2*	*CO1*
24.	a)	Explain the construction and working of an induction type single phase energy meter.	*11*	*K2*	*CO2*
		OR			
	b)	Discuss the errors caused and remedies given for a single-phase induction type energy meter.	*11*	*K2*	*CO2*
25.	a)	Draw the circuit diagram of Crompton's potentiometer and explain its working. Describe the steps used when measuring an unknown resistance.	*11*	*K2*	*CO3*
		OR			
	b)	Describe the working principle of Current Transformer in detail and draw the phasor diagram.	*11*	*K2*	*CO3*
26.	a)	With a neat diagram, explain the working of different types of Wave analysers.	*11*	*K2*	*CO4*
		OR			
	b)	Explain in detail about the working of Signal and function generators for a practical application.	*11*	*K2*	*CO4*
27.	a)	With a neat block diagram explain the working principle of a Digital Cathode Ray Oscilloscope. What are the advantages of analogue CRO?	*11*	*K2*	*CO5*
		OR			
	b)	Explain the working of a seven segment and Alphanumeric display in detail.	*11*	*K2*	*CO5*
28.	a)	Describe the construction and working of Light Emitting Diodes(LEDs) with neat diagrams.	*11*	*K2*	*CO5*
		OR			
	b)	Explain about the Internet of Things(IoT) based recorders in detail.	*11*	*K2*	*CO5*