	Reg. No.					
	Question Paper Code 13085					
	B.E. / B.Tech DEGREE EXAMINATIONS, NOV / DEC 2024					
	Third Semester					
	<b>Electronics and Instrumentation Engineering</b>					
	(Common to Instrumentation and Control Engineering)					
	20EIPC301 - ELECTRICAL AND ELECTRONIC MEASUREMENTS					
	Regulations - 2020					
D		ax. Mar	ks: 100			
2	PART - A (MCQ) $(20 \times 1 = 20 \text{ Marks})$					
	Answer ALL Questions	Marks	K– CO Level CO			
1.	What is the main advantage of using a PMMC instrument?	1	KI COI			
	(a) It can measure both AC and DC currents accurately					
	(b) It has a high frequency response					
	<ul><li>(c) It has a high accuracy and linear scale</li><li>(d) It is inexpensive compared to other instruments</li></ul>					
2.	If a Wheatstone bridge is balanced and the known resistors are $R_1=100 \Omega$ , $R_2=200\Omega$ , and	1	K2 CO1			
	$R_3=150\Omega$ , what is the value of the unknown resistance $R_4$ ?					
	(a) $100 \Omega$ (b) $150 \Omega$ (c) $200 \Omega$ (d) $300 \Omega$					
3.	What is the primary application of the Anderson bridge?	1	KI COI			
	<ul><li>(a) Measuring high resistance</li><li>(b) Measuring inductance</li><li>(c) Measuring capacitance</li><li>(d) Measuring low resistance</li></ul>					
4.	(c) Measuring capacitance (d) Measuring low resistance What is a typical range for high resistance measurements?	1	KI COI			
	(a) 1 ohm to 100 ohms (b) 100 ohms to 1 kilo-ohm					
	(c) 1 mega-ohm to 1000 mega-ohms (d) 10 kilo-ohms to 100 kilo-ohms					
5.	What is a common source of error in electrodynamometer measurements?	1	K1 CO2			
	(a) Thermal noise (b) Stray capacitance					
6.	<ul><li>(c) Frequency variation</li><li>(d) Temperature changes affecting coil resistanc</li><li>6. What type of error is reduced in an LPF wattmeter when measuring low power factor</li></ul>					
0.	circuits?	1	K1 CO2			
	(a) Phase error (b) Temperature error (c) Frequency error (d) Voltage error	r				
7.	Which communication technology is commonly used by smart meters to transmit data?	1	K1 CO2			
0	(a) Infrared (b) Bluetooth (c) Zigbee (d) Radio frequency (RF)		VI COD			
8.	Which security measure is important for smart energy meters to protect data integrity?(a) Regular physical inspections(b) Encryption of transmitted data	1	KI CO2			
	(c) Manual data entry (d) Use of analog meters					
9.	In an AC. co-ordinate potentiometer, the currents in the phase and quadrature	1	K2 CO3			
	potentiometer are adjusted to be					
	(a) out of phase by $90^{\circ}$ (b) of phase by $60^{\circ}$					
10	<ul> <li>(c) out of phase by 30°</li> <li>(d) out of phase by 0°</li> <li>Standardization of potentiometer is done in order that they become</li> </ul>	1	KI CO3			
10.	(a) Accurate (b) Precise (c) Accurate and Direct Reading (d) Accurate and precis		KI 005			
11.	Which of the following statements is true about instrument transformers?	1	K1 CO3			
	(a) They are used only in AC circuits (b) They are used only in DC circuits					
	(c) They are used in both AC and DC circuits (d) They are not used in any circuits		<b>W2</b> 000			
12.	Which of the following is true about the secondary current of a current transformer?	1	K2 CO3			
	<ul><li>(a) It is the same as the primary current</li><li>(b) It is higher than the primary current</li><li>(c) It is lower than the primary current</li><li>(d) It is independent of the primary current</li></ul>					
	(a) it is not primary current (a) it is independent of the primary current					

13.	What is the primary function of a wave analyz		1	K1	<i>CO4</i>		
	(a) Measure the voltage of a signal (b) Measure the frequency of a signal						
	(c) Analyze the harmonic components of a sig	nal (d) Generate a	sine wave				
14.	Quantities are digitized using			1	K1	<i>CO</i> 4	
		(c) Amplifier	(d) A/D converter				
15.	Q meter works on the principle of			1	Kl	CO4	
		b) piezoelectric effect					
	(c) parallel resonance (c)	l) series resonance					
16.	Which of the following factors can affect the a	accuracy of time perio	d measurements in	1	K1	<i>CO</i> 4	
	digital systems?						
	(a) Voltage fluctuations (b) Temperature changes						
	(c) Clock stability (d) Sig	gnal amplitude					
17.	Which part is called as heart of CRO?			1	K1	CO5	
	(a)CRT (b) Sweep generator (c)		(d) Amplifier				
18.	What is a common application for a seven-segment display?					CO5	
	(a) Televisions (b) Calculators (c)	Computer monitors	(d) Mobile phones				
19.	Which type of memory is generally used in da		-	1	K1	CO5	
	(a)RAM (b)ROM (c)Flash	•	0				
20.	Which communication protocols are common	y used by IoT-enable	d recorders to transmit	1	K1	CO5	
	data?						
	(a) HTTP and FTP (b) Blue	tooth and HDMI					
	(c)Wi-Fi, MQTT, and Lora (d) Analog and digital signals						

## PART - B $(10 \times 2 = 20 \text{ Marks})$

Answer ALL Questions

21.	Why PMMC is not suitable for AC measurement?	2	K1	CO1
22.	Define Q-Factor.	2	K1	CO1
23.	Mention the purpose of copper shading bands in induction type wattmeter.	2	<i>K1</i>	<i>CO2</i>
24.	Define phantom loading.	2	<i>K1</i>	<i>CO2</i>
25.	Compare and contrast AC and DC potentiometer.	2	K2	CO3
26.	Write the expression for calculating secondary winding burden in an instrument	2	K1	CO3
	transformer.			
27.	List the methods available in frequency measurements.	2	K1	<i>CO</i> 4
28.	State the basic working principle of LCR meters	2	K1	<i>CO</i> 4
29.	List the controllers normally found on XY recorder.	2	K1	<i>CO</i> 5
30.	Recall the main parts of a cathode ray tube.	2	K1	CO5

## PART - C ( $6 \times 10 = 60$ Marks)

Answer ALL Questions

31.	a)	Describe in	detail	with	neat	illustration,	the	construction,	working	principle	of	10	K2	<i>CO1</i>
		moving iron	meters											

## OR

- b) Illustrate the working of Schering bridge for the measurement of capacitance with 10 K2 CO1 neat diagram.
- 32. a) With a neat sketch describe the construction and working principle of dynamometer <sup>10</sup> K2 CO2 type wattmeter. Develop its torque equation.

## OR

b) Discuss the Errors Caused and Remedies of Single phase Induction type Energy 10 K2 CO2 meter.

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K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

33.	a)	Enumerate with neat sketch the working of Drysdale polar type AC potentiometer.							
OR									
	b)	Summarize the working principle of Potential Transformer in detail and draw the phasor diagram.	10	К2	CO3				
34.	a)	Explain the working of Wave analyzers with neat diagram and mention its application.	10	К2	<i>CO</i> 4				
		OR							
	b)	Draw and explain the working principle and operation of Digital LCR meter.	10	K2	<i>CO</i> 4				
35.	a)	Explain the working of seven segment and Alphanumeric displays in detail.	10	K2	<i>CO</i> 5				
OR									
	b)	Explain in detail the working a sampling oscilloscope with neat diagrams.	10	K2	CO5				
36.	a) i)	Write a technical note on Dual ramp type DVM.	5	K2	<i>CO</i> 4				
	ii)	Explain about XY Recorders with neat diagram.	5	K2	<i>CO</i> 5				
OR									
	b) i)	With neat diagram explain about Digital Time measurement.	5	K2	<i>CO</i> 4				
	ii)	Explain about LCD display devices.	5	K2	CO5				