Question Paper Code | 12067

2 1 JUL 2023

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023
Fourth Semester
Electrical and Electronics Engineering
20EEPC403 - MEASUREMENTS AND INSTRUMENTATION
(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks, K-Level, CO
1.	Define resolution and precision.	2,K1,CO1
2.	Define static sensitivity.	2,K1,CO1
3.	What is the basic principle of the PMMC instrument?	2,K1,CO2
4.	Illustrate the term creeping.	2,K1,CO2
5.	List various detectors used in AC Bridge.	2,K1,CO3
6.	Write the applications of DC potentiometer.	2,K1,CO3
7.	Define Interference.	2,K1,CO4
8.	List the various grounding techniques.	2,K1,CO4
9.	Compare LED and LCD.	2,K2,CO5
10.	What is PQ analyzer?	2,K2,CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11. a) Explain the functional elements of an instrument with a neat block diagram and example. — 13,K2,CO1

OR

b) (i) Explain in detail the types of errors and sources of errors in measurement techniques. — 7,K2,CO1

(ii) A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHZ were recorded as 532, 548, 543, 535, 546, 531, 543, and 536. Calculate (1) Arithmetic mean (2) Deviation (3) Average Deviation. — 6,K2,CO1

12. a) Describe the construction and working of PMMC instruments. Derive the equation for deflection if the instrument is spring controlled. Give the advantages and limitations of such instruments. — 13, K2,CO2

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create* **12067**

OR

b) Derive the expression for deflecting torque in single phase induction type energy meter. Show that the deflection is maximum when the phase angle between two fluxes is 90 degrees and when the disc is purely non inductive. *13,K2,CO2*

13. a) Explain how the inductance is measured in terms of known capacitance using maxwell's bridge. Derive the condition for balance and draw the phasor diagram. *13,K3,CO3*

OR

b) (i) Sketch the circuit of wheatstone bridge, explain its operation and derive the equation for the unknown resistance. *9,K2,CO3*

(ii) In the following Wheatstone bridge: $R_1 = 100\ \Omega$; $R_2 = 400\Omega$; $R_3 = 150\Omega$; Bridge excitation is given by 100V DC source; Calculate power excited by resistance R_x when the bridge is balanced. *4,K3,CO3*
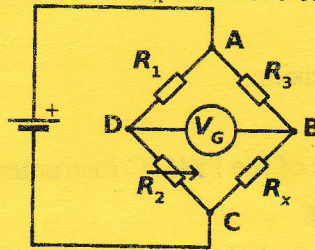
14. a) Explain about electrostatic and electromagnetic interference. *13,K2,CO4*

OR

b) Describe in detail about
(i) Multiple Earth and Earth loops *7,K2,CO4*
(ii) Grounding techniques *6,K2,CO4*

15. a) Draw and explain the block diagram of CRO. *13,K2,CO5*

OR

b) Describe the LED and LCD display devices. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Write in detail about the construction and working of LVDT. List the applications of LVDT. *15,K2,CO6*

OR

b) (i) Explain the concept of Smart Sensors. *7,K2,CO6*
(ii) Explain in detail the elements of the data acquisition system. *8,K2,CO6*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create **12067**

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