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Question Paper Code : 10577

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fourth Semester

Electrical and Electronics Engineering

EE 8403 — MEASUREMENTS AND INSTRUMENTATION

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name few static characteristics of an instrument.
2. Define gross error.
3. Define Creeping in Energy meter.
4. How can be the range of Ammeter and Voltmeter extended?
5. List the applications for various AC bridges.
6. How the electromagnetic interference can be minimised?
7. List the applications for Data loggers.
8. State the purpose of a lissajous pattern in CRO.
9. Define Smart Sensor.
10. State the Piezoelectric effect.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the functional elements of an instrument with a neat block diagram. Also discuss about the calibration of instruments.

Or

- (b) Explain construction and working principle of any one type of digital voltmeter (DVM).

12. (a) Explain the working of single phase AC energy meter with neat sketch and phasor diagram.

Or

- (b) Describe in detail, about the working principle, characteristics and applications of CT and PT.
13. (a) Explain how a low resistance can be measured using Kelvin double bridge.

Or

- (b) Describe the following :
- (i) Grounding techniques and (7)
- (ii) Causes of Electromagnetic interference. (6)
14. (a) Explain the working principle of digital storage oscilloscope with neat sketches.

Or

- (b) Explain the principle and working of CRT display with a neat diagram.
15. (a) Explain the working of Data Acquisition System and also list its applications.

Or

- (b) Explain the principle and working of LVDT. List different factors which affects its sensitivity.

PART C — ($1 \times 15 = 15$ marks)

16. (a) The four arms of a Hay's A.C bridge are arranged as follows: AB is a coil of unknown impedance; BC is a non-reactive resistor of 1000Ω ; CD is a non-reactive resistor of 833Ω in series with a standard capacitor of $0.38 \mu F$; DA is a non-reactive resistor of $16,800 \Omega$. If the supply frequency is 50 Hz, determine the inductance and the resistance at the balance condition.

Or

- (b) In Anderson A.C bridge, an impedance of inductance L and resistance R are connected between A and B. For balance following data is obtained. An ohmic resistance of 1000Ω each in arms AD and CD, a non-inductive resistance of 500Ω in BC, a pure resistance of 200Ω between points D and E and a capacitor of $2 \mu F$ between C and E. The supply is 10 volt (A.C.) at a frequency of 100 Hz and is connected across points A and C. Find L and R.