Reg. No. : [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Question Paper Code : 41033

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Fourth Semester

Electrical and Electronics Engineering

EE 3403 — MEASUREMENTS AND INSTRUMENTATION

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define Measurement.

2.   What is Measuring Lag?

3.   What is creeping and how it is prevented?

4.   List the classification of instruments.

5.   State the advantages of using the bridge circuits for the measurement.

6.   What is electrostatic shielding?

7.   Differentiate Sensor and Transducer.

8.   Define Piezo Electric Effect.

9.   What is DSO?

10. List the Basics of PLC Programming.

PART B — (5 × 13 = 65 marks)

11. (a)   Explain the static and dynamic characteristics of measurement system in detail.

Or

     (b)   Give the method of using any three standard inputs being for analyzing the dynamic response of system with neat sketches.

12. (a) Explain the construction of working principle of PMMC instrument in detail.

Or

(b) Write Short Notes on
   (i) Current Transformer (7)
   (ii) Energy Meter (6)

13. (a) Illustrate the procedure of measuring low resistance using Kelvin's double bridge. Derive the relation to find unknown resistance.

Or

(b) Explain the different techniques
   (i) Grounding (7)
   (ii) Causes of Electro magnetic Interference in measurements. (6)

14. (a) Categorize and explain the different types of resistive, capacitive and inductive transducer for measuring pressure.

Or

(b) List the selection criteria for transducer. Explain about the working principle of LVDT with neat sketch and its characteristics. List the advantages, Disadvantages and applications of LVDT.

15. (a) Explain in detail the characteristics of ADC and DAC converters.

Or

(b) Explain any two methods to measure the current and voltage.

PART C — (1 × 15 = 15 marks)

16. (a) Explain how the inductance is measured using known capacitance using Maxwell's bridge. Derive the conditions for balance.

Or

(b) A moving coil instrument gives full scale deflection for a current of 20 mA with a potential difference of 200 mV across it. Calculate
   (i) Shunt required to use it as an ammeter to get a range of 0-200 A. (8)
   (ii) Multiplier required to use it as a Voltmeter to get a range of 0-500 V. (7)