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**Question Paper Code : 80491**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Third Semester

Electrical and Electronics Engineering

EE 2201/EE 33/10133 EE 302/080280016 — MEASUREMENTS AND  
INSTRUMENTATION

(Regulations 2008/2010)

(Common to PTEE 2201 — Measurements and Instrumentation for B.E. (Part-Time)  
Third Semester Electrical and Electronics Engineering - Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. The expected value of the voltage across a resistor is 40V. However the measurement gives a value of 39V. Calculate the absolute error.
2. What are the various important functional elements of a typical measurement system?
3. A (0 – 25) A ammeter has a guaranteed accuracy of 1 percent of full scale reading. The current measured by this instrument is 10 A. Determine the limiting error in percentage.
4. Explain with example, the term 'Hysteresis'.
5. Compare A.C. and D.C. Potentiometer.
6. Write short notes on Grounding Techniques.
7. Compare merits and demerits of LED and LCD.
8. Draw the block diagram of digital CRO.
9. What is the difference between sensor and transducer?
10. Name some of the active transducers which are used in the measurement of temperature.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the following Static and dynamic characteristics
- (1) Static sensitivity
  - (2) Linearity
  - (3) Input impedance and loading effect
  - (4) Fidelity. (8)
- (ii) A temperature sensitive transducer is subjected to a sudden temperature change. It takes 10 s for the transducer to reach equilibrium condition (5 time constants). How long will it take for the transducer to read half of the temperature difference? (8)

Or

- (b) (i) Find out uncertainty in a measurement to find out the value of K related by the formula  $\theta_1 = \theta_2 * \exp(-K * T)$ . The value of  $\theta_1 = 28.1 \pm 0.2^\circ C$ ,  $\theta_2 = 18.3 \pm 0.2^\circ C$  and  $T = 6.8 \pm 0.1 s$ . (8)
- (ii) Explain different types of errors occurring in a measurement system. (8)
12. (a) (i) What are the main considerations in selecting a voltmeter? (8)
- (ii) With a neat block diagram of a digital multimeter explain their working principle. (8)

Or

- (b) On what principle a digital frequency meter works? Explain with neat diagrams.
13. (a) Explain how the inductance is measured in terms of known capacitance using Maxwell's bridge. Derive the conditions for balance. (16)

Or

- (b) Explain the following:
- (i) Grounding techniques. (8)
  - (ii) Causes of electromagnetic interferences in measurements. (8)
14. (a) (i) Explain the working principle of magnetic tape recorders. (8)
- (ii) Compare and contrast the working, advantages and disadvantages of LED and LCD. (8)

Or

- (b) (i) Discuss the working of digital CRO. (8)
- (ii) Write a detailed technical note on dot matrix display. (8)

15. (a) (i) Describe the construction and working of potentiometer type resistance transducer for measuring linear displacement. (8)
- (ii) Explain the working of D/A converter with a neat diagram. (8)

Or

- (b) (i) What is called Piezo electric transducer? Explain its working with a diagram. (8)
- (ii) Explain how to measure pressure using capacitive type transducer. (8)

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