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Question Paper Code : 71497

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Electrical and Electronics Engineering

EE 2201/EE 33/EI 1202/080280016/10133 EE 302 — MEASUREMENTS AND INSTRUMENTATION

(Regulation 2008/2010)

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

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define static error. Classify the types of static error.
2. What is the significance of calibration?
3. What are the different types of digital voltmeter?
4. List out the methods used for measurement of iron loss in ferromagnetic materials.
5. What is the need for screening?
6. What is meant by self balancing bridges? Give two examples.
7. Distinguish the functional difference between Strip chart recorder and X-Y recorder.
8. What are the functions of a data logger?
9. What are the applications of LVDT?
10. Define smart sensors.

PART B — (5 × 16 = 80 marks)

11. (a) Show the functional blocks of a generalized instrumentation system through a neat sketch. Also explain their functions in detail. (16)

Or

- (b) Eight different students timed in the circuit for resonance and the values of resonant frequency in kHz were recorded as 412, 428, 423, 415, 426, 411, 423 and 416. Calculate
- Arithmetic mean,
 - Deviation from the mean,
 - Average deviation, and
 - Standard deviation. (16)

12. (a) Describe the constructional details and working of the electro-dynamometer type wattmeter. What is the importance of deflection torque in these instruments? (12 + 4)

Or

- (b) Write short notes on :
- Use of current transformer for current and power measurement. (8)
 - Working of ferro-dynamic type electrical resonance frequency meter. (8)

13. (a) How a DC potentiometer is used for the calibration of a voltmeter? Explain it with a diagram. (16)

Or

- (b) (i) Discuss the effects of electro static and electromagnetic interference in instruments. (8)
- (ii) Write short notes on Grounding techniques. (8)

14. (a) Explain the principle of working of a magnetic tape recorder. What are its basic components and their functions? (10 + 6)

Or

- (b) With neat figure explain the working principle of a digital CRO. What are the advantages over analog CRO? (16)

15. (a) Explain the principle of the following transducers :

- Strain gauges (8)
- Piezo electric transducers. (8)

Or

- (b) What is data acquisition system? Give the block diagram arrangement of a data acquisition system and describe the function of each component. (16)