C 3232

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Sixth Semester

(Regulation 2004)

Electrical and Electronics Engineering

EI 1361 — MEASUREMENTS AND INSTRUMENTATION

(Common to B.E. (Part-Time) Fifth Semester Regulation – 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by accuracy of an instrument?

2. Define international standard for Ohm.

3. State the principle of digital voltmeter.

4. Give the importance of iron loss measurement.

5. Give some applications of Wheatstone's bridge.

6. A Maxwell bridge is having bridge constants at balance as $C_1 = 0.01 \ \mu F$, $R_1 = 470 \ K\Omega$, $R_2 = 5.1 \ K\Omega$ and $R_3 = 100 \ K\Omega$. Find the series equivalent of the unknown impedance.

7. What is meant by deflection sensitivity of a CRT?

8. Write two advantages of LED in electronic displays.

9. Give the factors to be considered for selecting a transducer.

10. Why is an A/D converter usually considered as an encoder?

PART B — (5 × 16 = 80 marks)

11. (a) Describe the functional elements of an instrument with its block diagram. And illustrate them with pressure gauge, pressure thermometer and D'Arsonval galvanometer. (16)

Or

(b) (i) What are the three categories of systematic errors in the instrument and explain in detail. (8)

(ii) Explain the Normal or Gaussian curve of errors in the study of random effects. (8)

12. (a) (i) Describe the construction and working of a permanent magnetic moving coil instruments. (10)

(ii) Explain the design of three phase watt meters and give the reactive power measurement in 3 phase circuits. (6)

Or

(b) (i) How the B-H curve is determined for a ring specimen? (8)

(ii) Explain the frequency measurement in Wien's bridge. (8)

13. (a) (i) Explain in detail about the laboratory type DC potentiometer. (10)

(ii) Give the applications of AC potentiometers. (6)

Or

(b) (i) Describe about the multiple earth and earth loops. (10)

(ii) Explain the different techniques of grounding. (6)

14. (a) (i) Explain in detail, how the data is stored in a magnetic disk and tape? (10)

(ii) Describe the performance of digital plotter. (6)

Or

(b) (i) Explain the block diagram of a general purpose oscilloscope and also describe about the observation of waveform on CRO. (10)

(ii) Write notes on Liquid Crystal Diodes (LCD). (6)

15. (a)

(b)

C 3232

15. (a) (i) Explain the resistive transducer with respective to potentiometer.

(4)

(ii) Explain the capacitive transducer. (6)

(iii) Describe the piezo electric transducer and give the formula for coupling coefficient. (6)

Or

(b) (i) Explain schematic block diagram of a general data acquisition system (DAS) and give its objectives. (6)

(ii) Discuss R-2R ladder type D/A converter. (6)

(iii) For a 5 bit ladder, if the input levels are $0 = 0$ V and $1 = 10$ V, what are the output voltages for each bit? (4)

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