A 260

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003

Fifth Semester

Electrical and Electronics Engineering

EE 331 — MEASUREMENTS AND INSTRUMENTATION

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the terms precision and sensitivity.

2. What are primary standards? Where are they used?

3. A 1 mA meter movement with an internal resistance of 100 Ω is to be converted into a 0–100 mA. Calculate the value of the shunt resistance required.

4. Brief the principle of digital phase meter.

5. List the important features of an Instrumentation amplifier.

6. What are data loggers? What are the functions of a data logger?

7. What is delayed sweep?

8. Give a short note on LED.

9. Explain about piezo electrical transducer.

10. Give a short note on magnetic flow meters.

PART B — (5 × 16 = 80 marks)

11. (i) For the given data, calculate

(1) Arithmetic mean

(2) Deviation of each value

(3) Algebraic sum of the deviations (7)

$x_1 = 49.7,\ x_2 = 50.1,\ x_3 = 50.2,\ x_4 = 49.6,\ x_5 = 49.7.$

(ii) Explain in detail the types of static error. (7)

(iii) Give a note on dynamic characteristics. (3)

12. (a) (i) Discuss in detail the working of the successive approximation DVM. (8)

(ii) Give a detailed notes on Instrument transformers. (8)

Or

(b) (i) With a neat diagram, explain the various methods of magnetic measurement. (8)

(ii) Explain with a neat sketch the construction and working principle of a wattmeter. (8)

13. (a) (i) Using Op-amp construct a Narrow band pass filter. Obtain the mathematical derivation for narrow band pass filter. (8)

(ii) Give a short note on multichannel PAS. (8)

Or

(b) (i) With a neat block diagram explain the 4 bit P/A converter. (8)

(ii) With a neat circuit diagram, explain the application of Instrumentation amplifier using transducer bridge. (8)

14. (a) (i) Discuss in detail about LCD's. (8)

(ii) Explain with a neat sketch

(1) Dot matrix displays

(2) Bar graph displays. (8)

Or

(b) (i) Explain the basic elements of a magnetic tape recorder. (8)

(ii) Explain the Block diagram of oscilloscope with a neat sketch. (8)

16. (a) (i) Discuss in detail, about [illegible] transducers. [illegible]

(ii) Explain the working of turbene flowmeter and list out its advantages and disadvantages. (8)

Or

(b) (i) Explain the various types of temperature transducers. (8)

(ii) Explain with a neat sketch

(1) Digital Tachometer

(2) Capacitive transducers. (4 + 4)