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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90518

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Fourth Semester

Electrical and Electronics Engineering

EE 8403 — MEASUREMENTS AND INSTRUMENTATION

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the functional elements of a measuring instrument.
2. Illustrate the difference between accuracy and precision.
3. List the possible causes of errors in moving iron instruments.
4. Give the importance of iron loss measurement.
5. Draw the circuit diagram write the expression for unknown inductance and its resistance of Anderson's bridge.
6. State the condition for balance in a wheatstone bridge.
7. Distinguish between LED and LCD.
8. Mention the different methods of magnetic tape recording.
9. Quote the principle of operation of optical transducer.
10. Classify any two applications of Smart Sensors.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain the functional elements of an instrument with a neat block diagram (7)

(ii) Describe the static and dynamic characteristics of measuring instruments. (6)

Or

(b) (i) Discuss the different types of standards and errors of Measurements. (7)

(ii) Discuss the significance of calibration. (6)

12. (a) Discuss with circuit and phasor diagram, describe the working of single phase AC Energy meter.

Or

(b) Describe the construction and working of permanent magnet moving coil instrument. Also derive the expression for deflection.

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

Or

(b) Describe in detail about:

(i) Interference and screening

(ii) Multiple earth and earth loops

14. (a) With the help of the fundamental block diagram, explain the working principle of digital storage oscilloscope, mention its advantages over analog CRO?

Or

(b) Explain the Dot matrix printer working and sketch the construction layout.

15. (a) (i) Describe the various factors influencing the type of transducer for a particular application. (7)

(ii) Examine how to measure pressure using capacitive type transducer. (6)

Or

(b) (i) Explain in brief about data acquisition system? With generalized block diagram, explain the functions of it. (7)

(ii) Describe about smart sensor. (6)

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PART C — (1 × 15 = 15 marks)

16. (a) Evaluate the expression for the current through the galvanometer in case of unbalanced Wheatstone Bridge and also state its application.

Or

(b) Explain how the inductance is measured in terms of known Capacitance using Maxwell's bridge. Compose the conditions for balance.