

Duration: 2 hrs

Marks: 60

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

- 1 **Attempt any Five** [15]
 a Define standardization and calibration of instruments.
 b Draw and explain Wheatstone bridge for measurement of resistance
 c Compare analog and digital instruments
 d List different types of errors in measurement
 e Compare RTD and Thermistor
 f Define accuracy, precision and resolution
- 2 a Explain operating, controlling and damping torques with suitable diagrams. [8]
 b Explain the measurement of unknown resistance using Kelvin Double Bridge. [7]
- 3 a Explain the procedure of calibration of voltmeter and wattmeter using Potentiometer. [7]
 b With neat diagram, explain the construction and working of CT and PT [8]
- 4 a Describe the measurement of temperature using RTD and Thermocouple. [8]
 b Explain the construction, working and operation of Digital Frequency Meter [7]
- 5 a Explain various features of digital storage oscilloscope. [8]
 b Explain the construction and working of linear variable differential transformer. [7]
- 6 a Explain Data Acquisition System with suitable block diagram. [7]
 b Write short notes on: **(Any two)** [8]
 i. Smart Sensor
 ii. Harmonic Analyzer
 iii. Smart Energy Meter

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