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14115

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any SIX :

12

- (a) Explain absolute and secondary instruments.
- (b) State principle of piezoelectric transducer.
- (c) Write the classification of temperature transducer.
- (d) State four applications of CRO.
- (e) Draw the schematic diagram of Instrumentation system.
- (f) State the need of signal generator. Also compare RF and AF type signal.
- (g) Give classification of transducers.
- (h) State function of Delay line in CRO and give its types.



P.T.O.

(B) Attempt any TWO :**8**

- (a) Explain primary and secondary transducers with the help of suitable diagram.
- (b) The expected value of voltage across resistor is 50 V. However the measurement give 49V. Calculate (i) absolute error (ii) Percentage (%) error.
- (c) Draw the constructional diagram for PMMC instrument neatly and label it. Also state the torque equation.

2. Attempt any FOUR :**16**

- (a) Draw the block diagram of time base generator and state its need.
- (b) Write the working principle of RTD. How the temperatures change is measured using RTD ?
- (c) Draw the block diagram of function generator. State its four applications.
- (d) With neat schematic diagram illustrate the working principle of Digital Frequency Meter.
- (e) Draw neat diagram of Electromagnetic flowmeter and explain its working principle.
- (f) Calculate the values for multipliers for internal resistance 100Ω of meter, full scale deflection current 50 mA and voltage range are 0–10 V, 0–100 V and 0–200 V.

3. Attempt any FOUR :**16**

- (a) Draw the circuit of basic DC Ammeter. Derive equation for shunt resistance.
- (b) Draw the neat block diagram of wave analyzer and state the function of each block.
- (c) Compare analog and digital multimeter on basis of (i) Resolution (ii) Function available and (iii) Power Consumption.

- (d) Give method of frequency measurement using Lissgous pattern.
- (e) Draw the schematic diagram of LVDT and describe its working.
- (f) Draw block schematic and working of dual trace CRO.

4. Attempt any FOUR :**16**

- (a) Define signal generation. Explain the need of signal generation.
- (b) Write working operation of CRT in a single trace CRO with neat diagram.
- (c) List four application of video pattern generator.
- (d) Draw the neat labelled block diagram of harmonic distortion analyzer. State its applications.
- (e) Differentiate between Active and Passive Transducers.
- (f) Describe construction of capacitive transducer. Explain its working suitable diagram.

5. Attempt any FOUR :**16**

- (a) What are the main function blocks of logic analyzer ? Give brief function of each block.
- (b) What is square wave generator ? Sketch the block diagram of square wave generator. State function of each block.
- (c) Compare time difference and Doppler type ultrasonic flowmeter. (Four points)
- (d) State the advantages of thermistor over RTD.
- (e) What is working principle of thermocouple ? Give its classification based on material used and temperature range.
- (f) Illustrate working of RVDT with help of diagram.

6. Attempt any FOUR :**16**

- (a) Write advantages of Digital Instrument over analog instrument.
 - (b) What is LCR meter ? Draw its block diagram.
 - (c) Draw neat block diagram of DSO. List its applications.
 - (d) Define Error. List the sources of error in measurement systems.
 - (e) With a neat diagram explain multirange analog AC voltmeter.
 - (f) Define (a) Fidelity (b) Lag.
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