

17435

21718

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) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (8) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. (A) Attempt any SIX :

12

- (a) List out dynamic characteristics of instruments.
- (b) Define : (i) Resolution (ii) Dead zone
- (c) State the function of Delay line in CRO.
- (d) Give one example each for : (i) Resistive transducer (ii) Inductive transducer.
- (e) Define temperature. Name any two temperature measuring units.
- (f) Name the types of wave analyser.
- (g) State any two advantages and two disadvantages of digital instruments.
- (h) State the principle of PMMC instruments.

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

- (a) Describe the working principle of Piezo electric transducer. State any two applications.
- (b) The expected value of voltage across resistor is 50 V. But the measured value is 49 V. Calculate (i) absolute error (ii) % (percentage) error.
- (c) Draw the circuit of basic DC Ammeter. Derive equation for shunt resistance.

2. Attempt any FOUR :**16**

- (a) Write the working principle of RTD. State how the temperature change is measured using RTD.
- (b) Draw the block diagram of digital multimeter and explain its working.
- (c) Define error. List the sources of error in measurement system.
- (d) Draw the constructional diagram of PMMC instrument. State the torque equation.
- (e) Draw the block diagram of instrumentation system. Explain each block in brief.
- (f) Draw the block diagram of function generator. State any four applications.

3. Attempt any FOUR :**16**

- (a) Draw the diagram of electromagnetic flow meter and explain its working.
- (b) Draw the diagram of LVDT. Explain how it is used to measure displacement.
- (c) Write working principle of CRT in a single trace CRO with diagram.

- (d) Draw the block diagram of frequency selective wave analyser and state the function of each block.
- (e) Describe the working principle of Digital Frequency Meter with diagram.
- (f) Describe the method of frequency measurement using Lissagous pattern.

4. Attempt any FOUR :**16**

- (a) Explain multirange analog AC voltmeter with neat diagram.
- (b) State any two function of LCR-Q meter. Draw its block diagram.
- (c) Draw the labelled block diagram of DSO. List any two applications.
- (d) What are the main functional blocks of logic analyser ? State the function of each block briefly.
- (e) Differentiate between active and passive transducer. (any four points)
- (f) Describe : (i) Seebeck effect (ii) Peltier effect

5. Attempt any FOUR :**16**

- (a) List any four specifications of analog DC ammeter and analog DC voltmeter.
- (b) Compare analog and digital multimeter on the basis of (i) Resolution (ii) Accuracy (iii) Function (iv) Power consumption.
- (c) Draw the block diagram of single beam dual trace CRO. Explain its operation.
- (d) Draw the block diagram of AF sine and square wave generator and explain its operation.
- (e) Draw labelled block diagram of video pattern generator.
- (f) Explain time difference type ultrasonic flow meter with diagram.

P.T.O.

6. Attempt any FOUR :**16**

- (a) Differentiate between logic analyser and spectrum analyser.
 - (b) Draw the block diagram of harmonic distortion analyser and state the function of each block.
 - (c) Define : (i) accuracy (ii) precision (iii) Drift (iv) Sensitivity
 - (d) Differentiate between single beam dual trace CRO and dual beam CRO. (based on any four factors)
 - (e) Describe the working principle of capacitive transducer with diagram.
 - (f) Describe the working principle of thermistor. State its advantages and disadvantages. (one each)
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