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11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any SIX :

12

- (a) Define primary & secondary transducer.
- (b) List any two materials for Piezoelectric transducer.
- (c) List different flow measurement methods.
- (d) State two applications of Ultrasonic level measurement.
- (e) What is Pt-100 ?
- (f) Give two applications of hair hygrometer.
- (g) Define absolute pressure.
- (h) List different temperature scales.

(B) Attempt any TWO :

8

- (a) Convert 200 °F into Celsius (°C) & Kelvin (°K)
- (b) Compare variable head flowmeter with variable area flow meter.
- (c) State the use of RADAR type level transducer & list two advantages.

2. Attempt any FOUR :**16**

- (a) What is Psychrometer ? Explain dry bulb thermometer & wet bulb thermometer.
- (b) State seeback effect. Describe the working of thermocouple.
- (c) State the selection criteria for transducer (any eight points).
- (d) Draw the following & write application of each :
 - (i) Well type manometer
 - (ii) Bellows
- (e) State two advantages & two disadvantages of electromagnetic flow meter.
- (f) Describe working principle of Ultrasonic level detector with diagram.

3. Attempt any FOUR :**16**

- (a) Write example of each type
 - (i) Primary transducer
 - (ii) Active transducer
 - (iii) Electrical transducer
 - (iv) Digital transducer
- (b) Draw constructional details of C-type Bourdon tube & explain its working.
- (c) Compare contact type & non-contact type methods of speed measurement.
- (d) Calculate output resistance of PT-100 RTD for temperature value 40° C & 80° C.

- (e) Compare orifice with venturi tube with reference to
 - (i) Working principle
 - (ii) Construction
 - (iii) Cost
 - (iv) Pressure loss
- (f) Compare between PTC & NTC.

4. Attempt any FOUR :**16**

- (a) What is pyrometer ? Explain any one type of pyrometer.
- (b) State working principle of capacitive type level measurement with diagram.
- (c) Describe the working principle of photoelectric pickup type tachogenerator.
- (d) State how pressure measurement can be done using Dead weight tester.
- (e) Sketch diagram for pressure measurement using diaphragm with strain gauge.
- (f) State principle of operation of piezo-electric transducer. State its application.

5. Attempt any FOUR :**16**

- (a) Write the materials used for 'type J' & 'type K' thermocouple alongwith their temperature range & its sensitivity.
- (b) State need of level measurement. Also, classify level measurement methods.
- (c) Define Laminar flow & turbulent flow. Also, write two units for flow measurement.
- (d) Describe the working principle of U-tube manometer with neat diagram.
- (e) Draw block diagram of instrumentation system. State function of each block.
- (f) Compare AC & DC tachogenerators.

P.T.O.

6. Attempt any FOUR :**16**

- (a) Draw constructional diagram of LVDT. State its working principle.
 - (b) Compare capsule & Bellows with the help of
 - (i) Material used
 - (ii) Construction
 - (iii) Range of measurement
 - (iv) Working principle
 - (c) Explain the working principle of Doppler type Ultrasonic flow meter.
 - (d) How level is measured by using float ? State material used for float.
 - (e) Explain with suitable diagram, how gas filled thermometer works.
 - (f) Define absolute & relative humidity.
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