

17434

21415

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any SIX of the following:** **12**
- (i) List the four different units of pressure.
- (ii) Define transducer. Give two examples.
- (iii) State seeback and peltier effect.
- (iv) Why Rotameter is called variable area meter?
- (v) Define:
- 1) Absolute Humidity
- 2) Relative Humidity
- (vi) State the working principle of thermocouple.
- (vii) State the different types of flow.
- (viii) Draw the block diagram of instrumentation system.

P.T.O.

b) **Attempt any TWO of the following:****8**

- (i) Describe working of venturimeter with neat sketch.
- (ii) Explain the working of dead weight tester with neat diagram.
- (iii) With neat diagram, explain working of capacitance level measurement.

2. **Attempt any FOUR of the following:****16**

- a) Draw the constructional detail of 'C' type Bourdon tube and explain its working.
- b) Write application of following transducer.
 - (i) Venturi tube
 - (ii) Orifice plate
 - (iii) Ultrasonic flow meter
 - (iv) Positive displacement flow meter.
- c) Give construction, working principle of RTD with a neat sketch.
- d) List the advantages and disadvantages of float types level gauges.
- e) State the selection criteria for transducer (any eight points).
- f) Describe how humidity is measured by using hair type hygrometer.

3. Attempt any FOUR of the following:**16**

- a) Draw construction diagram of LVDT with label. Also state the application of LVDT.
- b) What are the different pressure measurement method? State the working principle of U - tube manometer.
- c) Describe the radiation type level measurement technique.
- d) Compare NTC and PTC w.r.t. thermistor. (any four points)
- e) Describe how speed is measured by photoelectric method with neat diagram.
- f) Describe with neat diagram how temperature is measured by liquid filled thermometer.

4. Attempt any FOUR of the following:**16**

- a) Describe the work in principle of Ultrasonic level measurement with neat diagram.
- b) What is piezoelectric effect? Name two piezoelectric materials.
- c) What is pyrometry? Describe working of optical pyrometer with neat diagram.
- d) What is tachometer? Explain photo - electric pickup.
- e) State two advantages and two drawbacks of liquid filled and gas filled thermometer.
- f) What is capsule? How it is used for pressure measurement?

5. Attempt any FOUR of the following:**16**

- a) Explain any one type of ultrasonic flow meter with neat diagram.
- b) What is thermistor? Discuss its different types with proper diagram.
- c) Classify each of the following transducers in two different categories.
 - (i) Thermocouple
 - (ii) LVDT
 - (iii) Bourdon tube
 - (iv) Strain guage
- d) Draw a diagram of radar level measurement. Write an advantages and disadvantages of it.
- e) State the advantages and disadvantages of photoelectric tachometer.
- f) Define guage factor. How strain guage is suitable for pressure measurement.

6. Attempt any FOUR of the following:**16**

- a) Explain working principle of RVDT with figure.
 - b) Draw the experimental setup to measure pressure in terms of voltage. And also discuss which types of transducer used in it.
 - c) Compare orifice plate and venture tube with reference to:
 - (i) Working principle
 - (ii) Construction
 - (iii) Maintenance cost
 - (iv) Use.
 - d) Compare Ultrasonic and Radar level measurement with respect to working principle and constructions.
 - e) Explain working principle of bimetallic thermometer.
 - f) Compare between U tube and well type manometers.
(any four points).
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