

# 17434

**21819**

**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 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.

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- 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) Describe principle of operation of Doppler type ultrasonic flow meter with diagram.
  - c) Give construction working principle of RTD with a neat sketch.
  - d) List the advantages and disadvantages of float type level gauge.
  - e) State the selection criteria for transducer (any eight points)
  - f) Describe how humidity is measured by using hair 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 (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 working 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) Explain contact type level transducer.
  - e) List applications of thermometer and thermistor.
  - f) What is capsule? How it is used for pressure measurement?
- 5. Attempt any FOUR of the following:** **16**
- a) Describe the construction of orifice plate flow meter.
  - b) Calculate the o/p resistance of PT 100 RTD for temperature values 35°C and 85°C.
  - c) Write example of each type:
    - (i) Primary transducer
    - (ii) Secondary transducer
    - (iii) Active transducer
    - (iv) Electrical transducer
  - d) List two applications and two advantages of ultrasonic flow type transducer.
  - e) Describe working of dry and wet bulb thermometer.
  - f) State advantages and disadvantages of photoelectric tachometer.

- 6. Attempt any FOUR of the following:** **16**
- a) Draw experimental setup to measure pressure in terms of voltage. And also discuss which type of transducer is used in it.
  - b) Compare active and passive transducer.
  - c) Compare orifice plate with venturi tube with ref. to working principle, construction, maintenance, cost.
  - d) Compare between U tube and well type manometer.
  - e) Explain working principle of bimetallic thermometer.
  - f) List two advantages of capsule and bellows.
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