

22335

24225

3 Hours / 70 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 answer with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **10**
- a) State one example of primary and secondary transducer.
 - b) Give classification of piezoelectric materials.
 - c) List any two advantages of inclined tube manometer.
 - d) Express the pressure 240-mm Hg vacuum into absolute pressure.
 - e) Define –
 - i) Laminar flow
 - ii) Turbulent flow.
 - f) Classify the following flowmeters as variable head or variable area type –
 - i) Pitot tube
 - ii) Rotameter.
 - g) List the direct methods of level measurement.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain with neat diagram working of photo voltaic cell.
 - b) Draw neat sketch of bellow coupled with LVDT and explain it in brief.
 - c) Give advantages and disadvantages of electromagnetic flow meter.
 - d) Explain with neat sketch the working of radiation type level detector.
- 3. Attempt any THREE of the following:** **12**
- a) Compare LVDT with RVDT. (Any four points)
 - b) Describe how calibration of pressure gauge is done by using dead weight tester.
 - c) State the plates of parallel plate capacitor and dielectric used in the design capacitive level detector if
 - i) Liquid in tank is conductive
 - ii) Liquid in tank is non inductive.
 - d) Convert 250°F (250 Fahrenheit) into Celsius, Kelvin, Reaumur and Rankine scale.
- 4. Attempt any THREE of the following:** **12**
- a) Identify the functional elements or blocks of thermistor based temperature measurement system.
 - b) Draw the figure indicating atmospheric pressure, gauge pressure and absolute pressure.
 - c) Compare venturi tube with orifice plate with reference to –
 - i) Working principle
 - ii) Construction
 - iii) Maintenance
 - iv) Cost.
 - d) Compare ultrasonic and radar level detector with reference to working principle and construction.

e) Define –

i) NTC

ii) PTC.

Draw characteristics and give example of each.

5. Attempt any TWO of the following: 12

- a) Explain the operation of vortex flow meter state its advantages and disadvantages.
- b) Draw neat sketch of hydrostatic type (air purge) level measurement and explain its working principle in brief.
- c) Suggest suitable temperature transducer to measure process temperature of around 550°C. Draw construction and write its mathematical equation.

6. Attempt any TWO of the following: 12

- a) Explain how pressure is measured with well type manometer. State its advantages and disadvantages.
 - b) Describe with neat sketch the Corioli's mass flow meter. State its two applications.
 - c) State and explain the laws of thermocouple circuit –
 - i) Seebeck effect
 - ii) Law of intermediate metals
 - iii) Law of intermediate temperature.
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