

- N.B:
1. Question.No.1 is compulsory.
  2. Attempt any three questions from remaining five questions.
  3. Assume suitable data wherever necessary.

- 1 Attempt any four : 20
- Explain absolute humidity and relative humidity.
  - What do you mean by calibration? What is the need of calibration?
  - Explain sensor characteristics i) Hysteresis and ii) Linearity.
  - What is base metal and rare metal thermocouples? State their advantages and disadvantages.
  - Explain liquid level measurement using float and LVDT with appropriate diagram .
- 2
- Explain different types of errors in measurements with their remedies. 10
  - Explain flapper nozzle system and comment on its application. 10
- 3
- Explain radioactive type level detector in detail. 10
  - A capacitive transducer uses two quartz diaphragms of area  $750 \text{ mm}^2$  separated by a distance of  $3.5 \text{ mm}$  .A pressure of  $900 \text{ kN/m}^2$  when applied to the top diaphragm produces a deflection of  $0.6 \text{ mm}$  .The capacitance is  $370 \text{ pF}$  when no pressure is applied to the diaphragms .Find the value of capacitance after the application of a pressure of  $900 \text{ kN/m}^2$ . 10
- 4
- State different types of pyrometers .Explain with a neat sketch any one of them. 10
  - State and explain laws of intermediate temperature and intermediate metals of thermocouple.Write the significance of these laws . 10
- 5
- Explain construction and working principle of LVDT. 10
  - A linear resistance potentiometer is  $50 \text{ mm}$  long and is uniformly wound with a wire having a resistance of  $10 \text{ K} .\Omega$  Under normal conditions, the slider is at the center of the potentiometer .Find the linear displacement when the resistance of the potentiometer as measured by a Wheatstone bridge for two cases is i)  $3850\Omega$  ii)  $7560. \Omega$  Are the two displacements in the same direction? If it is possible to measure a minimum value of  $10 \Omega$  resistance with the above arrangement, find the resolution of the potentiometer in mm. 10
- 6 Write a short note on (Any two) :- 20
- Hall Effect Transducer
  - Sound Pressure Level meter
  - Air purge type level gauge.
  - Lead wire compensation in RTD