22420

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3 Hours / 70 Marks   Seat No.

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) 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) Define Primary and Secondary transducer and give one example of each.

b) List the four different units of pressure.

c) State formula for Reynold's number.

d) List different flow measurement methods.

e) Give two advantages and disadvantages of float type level sensor.

f) State seeback effect.

g) List any four temperature scale and state their abbreviates.

Marks

2. **Attempt any <u>THREE</u> of the following:** 12

a) Explain with neat sketch construction and working of bonded strain gauge.

b) Draw the block diagram of instrumentation system and state the function of each block.

c) Draw the figure showing Vacuum, Atmospheric pressure, gauge pressure and absolute pressure.

d) Explain in detail calibration technique and draw the calibration curve in general for pressure measurement.

3. **Attempt any <u>THREE</u> of the following:** 12

a) State the selection criteria of transducer for any application. (any eight points)

b) Compare active and passive transducer. (Any four points)

c) Explain construction, working principle of Bourdon tube with neat sketch.

d) Explain working of Electromagnetic flowmeter. Give its mathematical equation.

4. **Attempt any <u>THREE</u> of the following:** 12

a) Explain different types of orifice plates with figure.

b) Explain with the help of neat sketch Hook type level measurement.

c) Explain working principle of hydrostatic type level measurement.

d) Compare ultrasonic and radar level measurement with respect to working principle, construction, waves used and application.

e) Convert the following temperature from °f (fahrenheit) to °C (celsius)

i) 0°F

ii) −40°F

iii) 250°F

iv) 41°F

Marks

5. **Attempt any** <u>**TWO**</u> **of the following:** **12**

   a) Draw constructional diagram of LVDT. State its working principle for displacement measurement.

   b) Determine the velocity of flow in an electromagnetic flow meter for flowing condition. The flux density in the liquid has an average value of 0.08 weber/m^2. The diameter of the pipe is 10 cm. The induced voltage of electromagnetic flow meter is recorded as 0.2 mV.

   c) State applications and compare the advantages and disadvantages of an Nutating disc meter and Lobed impeller meter.

6. **Attempt any** <u>**TWO**</u> **of the following:** **12**

   a) Explain the working of following level detector with neat sketch.

      i)   Capacitance level detector

      ii) Ultrasonic level detector

   b) Compare RTD with thermistor with reference to

      i)   Working principle

      ii) Relation between temperature and resistance

      iii) Materials

      iv) Range of measurement

      v)   Cost

   c) Describe calibration procedure with a neat diagram of temperature measurement system with input from RTD and thermocouple.

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