22227

23124

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

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

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) Give the classification of instruments.

(b) State the advantages of Bourdon Pressure Tube (any four).

(c) State the disadvantages of Thermocouple Vacuum Gauge (any four).

(d) Draw any two shapes of Thermister.

(e) State the applications of RTD (any four).

(f) Name any four materials used for grid of strain gauge.

(g) State the advantages of Drag Cup Tachogenerator (any four).

2. Attempt any THREE of the following : **12**

(a) Describe the various types of measurement.

(b) Explain the McLeod gauge with neat sketch.

(c) Give selection criteria for displacement transducers.

(d) Differentiae between Resistance thermometer and Thermistor.

3. Attempt any THREE of the following : **12**

(a) List static and dynamic characteristics (two each).

(b) Explain the construction and working of Stroboscope with neat sketch.

(c) Explain the construction and working of Hair Hygrometer with neat sketch.

(d) Explain the construction and working of Hot Wire Anemometer with neat sketch.

(e) Explain the use of variable area flow meter with neat sketch for measurement of flow rate of coolant in plastic processing. State its two limitations.

4. Attempt any THREE of the following : **12**

(a) A 4 cm long liner resistance potentiometer is uniformly wound with a wire having a resistance 8 kΩ under normal conditions; the slider is positioned at the centre of potentiometer. During the operation, the slider moves over the resistance elements, and resistance of the potentiometer as measured by a Wheatstone bridge is (i) 3.2 kΩ and (ii) 6 kΩ. Find the linear displacement and comment on the direction of the two displacements.

(b) Explain the working of radiation pyrometer with neat sketch.

(c) Explain the unbounded stain gauge with neat sketch.

(d) Explain the construction and working of Vortex Shedding flowmeter with neat sketch.

(e) Explain the use of Float and Shaft type gauge for liquid level measurement with neat sketch.

5. Attempt any TWO of the following : **12**

(a) Explain the construction and working of LVDT with neat sketch. State the applications of it.

(b) Describe the Law of intermediate temperature, Law of intermediate Metal and Peltier effect.

(c) Describe the use of Eddy Current Dynamometer for shaft power measurement with neat sketch. State its advantages and disadvantages.

6. Attempt any TWO of the following : **12**

(a) Explain the Pirani gauge with suitable sketch. State its advantages.

(b) Give the classification of temperature measuring instruments. State their different temperature ranges.

(c) Explain inductive pick-up type tachometer with its applications, advantages and disadvantages.