22443

12223

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 : **10**

(a) State any four factors to be considered while selecting displacement transducer.

(b) State any four advantages of load cell.

(c) State the law of intermediate metal.

(d) State the advantages of flow nozzles.

(e) State the advantages of inductive type transducer.

(f) Define the relative humidity.

(g) State the applications of LVDT.

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

(a) Define hysteresis. Explain the significance of hysteresis in a measuring instrument.

(b) Describe Creep curve for force transducer with neat sketch.

(c) Explain the construction and working of McLeod gauge with neat sketch.

(d) Differentiate between orifice plate and venturimeter.

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

(a) Differentiate between active and passive transducers.

(b) Describe the classification of errors.

(c) Explain the strain gauge transmission dynamometer with neat sketch.

(d) Describe the construction and working principle of optical pyrometer with neat sketch.

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

(a) A 4 cm long linear resistance potentiometer is uniformly wound with a wire having a resistance 8 kΩ. Under normal conditions, the slider is positioned at the centre of the potentiometer. During the operation, the slider moves over the resistance element, and resistance of the potentiometer as measured by a Wheatstone bridge is (1) 3.2 kΩ and 6 kΩ. Find the linear displacement and comment on the direction of the two displacements.

(b) Describe the construction and working of the vapour pressure thermometers with neat sketch.

(c) Give the comparison for K, J and R type of thermocouples on the basis of material, composition, sensitivity, accuracy, range and features.

(d) Explain the foil type strain gauges with neat sketch.

(e) Explain the construction and working of hair hygrometer with neat sketch.

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

(a) Describe the block diagram of generalized measurement system and various elements.

(b) Describe the construction and working of Coriolies flow meter with neat sketch. State its advantages.

(c) Describe the measurement process of sound with carbon microphone. State its advantages.

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

(a) Describe the construction and working of the ultrasonic flow meter with neat sketch. Explain the transit time of ultrasonic flow meter in brief.

(b) Describe the construction and working of FFT analyser with neat sketch. Enlist its major applications.

(c) Draw the sketch of photoelectric tachometer and explain speed measurement process with it.
