11718

3 Hours / 100 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. (A) Attempt any SIX : **12**

(a) List the four different units of pressure.

(b) List any two piezoelectric materials.

(c) Draw the different shapes of thermistors.

(d) Define laminar and turbulent flow.

(e) Define humidity. State its units.

(f) Classify the temperature measuring transducers.

(g) State classification of flow meters.

(h) State two advantages of electrical transducers.

(B) Attempt any TWO : **08**

(a) With the help of neat sketch, state working principle of rotameter.

(b) Describe how calibration of pressure gauges is done by using dead weight tester.

(c) What is need of level measurement ? Give classification of level measurement methods with two examples of each.

2. Attempt any FOUR : **16**

(a) State working principle of 'C' type bourdon tube with neat diagram.

(b) Describe working of venture meter with neat sketch.

(c) Describe working principle of optical pyrometer with neat diagram.

(d) Write two advantages and applications of ultrasonic level measurement.

(e) Draw block diagram of instrumentation system. Explain function of each block.

(f) Describe how humidity is measured by using hair type hygrometer.

3. Attempt any FOUR : **16**

(a) Give two examples of each of the following :

(i) Active transducer (ii) Digital transducer

(iii) Analog transducer (iv) Electrical transducer

(b) List different elastic pressure transducers and draw constructional details of any one.

(c) With neat diagram, explain working of capacitance level measurement.

(d) Compare between RTD and thermistor with respect to :

(i) Size (ii) Cost

(iii) Material of construction (iv) Temperature range

(e) With the help of suitable diagram, explain how humidity is measured with dry and wet bulb thermometer.

(f) Convert 200°F (Fahrenheit) into Celsius, Kelvin, Reaumur, Rankine scale.

4. Attempt any FOUR : **16**

(a) Describe working principle of ultrasonic method of level measurement with neat sketch.

(b) Describe any four selection criterion of transducers.

(c) Describe with neat diagram, how temperature is measured by Gas filled thermometer.

(d) Draw the construction and explain the working of photoelectric pick-up type speed measuring transducer.

(e) State Seeback effect and Peltier effect. Write material used in different thermocouples.

(f) Sketch constructional diagram of inclined tube manometer. State its advantages and disadvantages.

5. Attempt any FOUR : **16**

(a) Explain working principle of Doppler type ultrasonic flow meter. Give its two advantages and disadvantages.

(b) State comparison between PTC and NTC.

P.T.O.

(c) Is piezoelectric transducer active or passive ? Give reason. Also state the principle of operation of piezoelectric transducer.

(d) Draw a neat setup diagram to measure level of liquid in a tank using a float and potentiometer. Also identify the primary sensor and secondary transducer in this setup.

(e) Compare contact type and non-contact type speed measurement methods.

(f) Define pressure. Give the detailed classification of pressure measuring devices.

6. Attempt any FOUR : **16**

(a) Describe the construction, working of an inductive transducer used as a displacement transducer.

(b) How strain gauge is used for pressure measurement ? Explain.

(c) Compare orifice plate and venture tube with reference to :

(i) Working principle (ii) Construction

(iii) Maintenance cost (iv) Use

(d) Describe the working of radiation type level measurement. List two advantages of it.

(e) Explain working principle of bimetallic thermometer.

(f) Compare between U tube and well type manometers. (any four points)
