23242

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following : **10**

(a) List any two points to be considered while selecting a transducer.

(b) State working principle of diaphragm.

(c) State classification of level measurement.

(d) List any two advantages and disadvantages of bimetallic thermometer.

(e) List any two light sensors.

(f) State law of thermodynamics.

(g) Define telemetry and list the types of telemetry.

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

(a) Explain with diagram the working principle of pneumatic sensor.

(b) Explain construction and working of RTD.

(c) Describe briefly the working principle of U-tube manometer.

(d) List the factors that decide the configuration and sub-system of data acquisition system.

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

(a) (i) Define :

(1) Gauge Pressure

(2) Absolute Pressure

(ii) List any one example of following :

(1) Elastic Pressure Transducer

(2) Electronic Pressure Transducer

(b) How humidity is measured by using hair type hygrometer ?

(c) (i) Compare strip chart recorder and analog X-Y recorder (Any two points).

(ii) List application of data acquisition system.

(d) Compare Thermistor and RTD (Any four points).

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

(a) Explain with neat diagram how pressure is measured using Bourdon tube with LVDT.

(b) Suggest suitable telemetry system for direct transmission in situation where frequency spectra of the signal are not suitable for transmission and explain working of it.

(c) (i) State applications of Venturimeter

(ii) List the methods of speed measurement

(d) State the temperature range for RTD, Thermistor, Thermocouple and Pyrometer.

(e) What are the methods of data transmission ? Explain electric type transmission.

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

(a) Draw a neat and labelled block diagram of instrumentation system and explain function of each block.

(b) (i) Explain with diagram magnetic pick up type sensor.

(ii) Draw neat diagram of capacitive type level meter.

(c) (i) Describe the working of LED with diagram.

(ii) Compare between analog and automated data acquisition system.

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

(a) List the criteria for selection of a sensor for industrial application.

(b) Describe the procedure to calibrate pressure gauge using dead weight tester.

(c) A Newtonian fluid having dynamic or absolute viscosity of 0.38 Ns/m^2 and specific gravity of 0.91 flows through a 25 mm diameter pipe with a velocity of 2.6 m/s. Calculate Reynold's number. Based on Reynold's Number state and justify the type of flow.
