313319

24225

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.

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

(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 standard and error in measurement.

(b) List different types of microphone.

(c) State one example each of primary and secondary transducer.

(d) Define laminar and turbulent flow based on Reynold's number.

(e) List any four types of strain gauges.

(f) Define absolute pressure and gauge pressure.

(g) List different linear and non-linear signal conditioning circuits.

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

(a) Explain random error in measurement with suitable example (any one).

(b) Draw block diagram of data acquisition system. State function of each block used in it.

(c) Explain bourdon tube coupled with LVDT with neat diagram.

(d) State any four types of thermocouple with material used for construction and temperature range.

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

(a) Draw & explain block diagram of instrumentation system.

(b) Compare LVDT with RVDT (any four points).

(c) Explain operation of radiation pyrometer with neat diagram.

(d) Classify methods of level measurement. Draw set-up diagram of nuclear radiation type level detector.

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

(a) Explain operation of eddy current dynamometer in brief.

(b) Differentiate between thermistor and RTD.

(c) Draw neat sketch of three op-amp instrumentation amplifier and explain its operation in brief.

(d) Explain the operation of dynamic type microphone with neat diagram.

(e) State need of signal conditioning circuit. Explain working of DC wheatstone bridge.

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

(a) Explain the working principle of piezoelectric load cell with neat diagram. State its two advantages and limitations.

(b) Draw neat labelled diagram of float with linear and rotary potentiometer.

(c) Explain working principle of hair hygrometer, resistive hygrometer in brief.

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

(a) List contactless tachometers. Compare AC tachometer with DC tachometer.

(b) Explain the operation of swirlmeter with neat diagram.

(c) (i) Draw the construction of bourdon tube pressure gauge.

(ii) List the materials used for constructing the bourdon tube.

(iii) State the types of bourdon tubes.
