

22420

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
- (6) Preferably, write the answers in sequential order.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) State the need of transducers in instrumentation system.
- b) Define :-
- i) Atmospheric Pressure.
- ii) Gauge Pressure
- c) List the types of electrical flow meter.
- d) Define :-
- i) Laminar flow.
- ii) Turbulent flow.
- e) Write applications of level transducer (Any four).
- f) List units of temperature and conversion formula for them (Any two unit).
- g) Name the metals used in J and K type thermocouple.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) State the working principle of potentiometer, describe the major difference in linear and angular potentiometer.
 - b) Write any two applications of capacitive and inductive transducer.
 - c) Describe the classification of pressure transducers.
 - d) i) Describe with neat diagram the measurement of pressure using Bourdon tube with LVDT.
ii) State the advantage of this system over Bourdon tube system.
- 3. Attempt any THREE of the following:** **12**
- a) Classify the following transducer at least by two ways :-
 - i) Strain gauge and
 - ii) Thermocouple.
 - b) Describe criteria for the selection of transducer for following applications :-
 - i) Weighting machine in grocery shop.
 - ii) Water level controller for home.
 - c) Differentiate between the u-tube manometer and inclined tube manometer.
 - d) Describe the construction and working of the orifice plate meter.
- 4. Attempt any THREE of the following:** **12**
- a) Draw neat sketch of Rota meter and explain the use of it for the flow measurement.
 - b) i) State the working principle of ultrasonic type level measurement with help of neat sketch.
ii) State the frequency range of the same.
 - c) Describe the salient features of the float type level measurement transducer.
 - d) Compare ultrasonic type and radar type level measurement transducer
 - e) Write the advantages and limitations of optical pyrometer.

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

- a)
 - i) Describe the calibration procedure with help of sketch for capsule and diaphragm type transducer.
 - ii) State the range of pressure measured by diaphragm type transducer.
- b) Describe the problems occurs in working of ultrasonic flow meter and write the procedure to troubleshoot these problems.
- c) Draw labelled diagram of electromagnetic flow meter and write the output equation of it and basic condition for working of this flow meter.

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

- a) Explain the calibration procedure for capacitance type level transducer.
 - b)
 - i) Describe the working of RTD with help of sketch.
 - ii) Write its two applications and material used in it.
 - c) Suggest the temperature transducer with reason for the following applications.
 - i) Temperature of the winding of electrical machines.
 - ii) Temperature of refrigerator and air conditioner.
 - iii) Temperature of furnace and oven.
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