# 22420

## 12425 03 Hours / 70 Marks Seat No. I

Instructions – (1) All Questions are Compulsory.

- (2) Answer each next main Question on a new page.
- (3) Illustrate your answer 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

10

## 1. Attempt any <u>FIVE</u> of the following:

a) State the need of transducers in instrumentation system.

- b) List out any two pressure measuring devices.
- c) Define Reynold's number, turbulent flow.
- d) Give two advantages and disadvantages of float type level sensor.
- e) Name the metals used in J and K type thermocouple.
- f) List the types of electrical flow meter.
- g) List any four temperature scale and state their abbreviates.

Marks

### 2. Attempt any THREE of the following: 12 State the selection criteria of transducers. (Any eight points) a) b) Draw neat diagram of Bourdon Tube Pressure gauge and explain its working. Explain different types of orifice plates with figure. c) d) Explain radiation type level measurement technique. 3. Attempt any THREE of the following: 12 State function of each block of instrumentation system with a) diagram. b) Explain with neat diagram Bourdon tube with LVDT. c) Draw neat sketches of Linear and Rotary potentiometer liquid level gauge. Describe with diagram of optical pyrometer type temperature d) sensor 4. Attempt any THREE of the following: 12 a) Write any two applications of capacitive and inductive transducer. b) Differentiate between the u-tube manometer and inclined tube manometer. c) Explain the working of electromagnetic flow meter with neat diagram. d) Describe the salient features of the float type level measurement transducer. e) Convert the following temperature from °F (Fahrenheit) to °C (Celsius): 0°F i)

- ii) -40°F
- iii) 250°F
- iv) 41°F

Marks

#### Attempt any TWO of the following: 5.

- a) Draw constructional diagram of LVDT. State its working principle for displacement measurement.
- b) How pressure gauge is calibrated with dead weight tester. Explain with diagram.
- c) Explain the working of rotameter with neat diagram.

#### Attempt any TWO of the following: 6.

12

- a) Compare between:
  - Ultrasonic and radar type level measurement. i)
  - List out the typical specifications of electrical level ii) measurement methods.
- b) Compare RTD, thermocouple and thermistor. (Any four points)
- c) Draw labelled diagram of time difference and doppler type ultrasonic flow meter. Explain any one.

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