

17434

14115

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) Draw only diagram of capsule.
- (b) State the necessity of transducer.
- (c) List the different temperature scales.
- (d) Define laminar flow and turbulent flow.
- (e) Define Humidity. State its units.
- (f) Draw circuit diagram of two wire system RTD connection.
- (g) State classification of flow meters.
- (h) Classify Electrical transducers.



P.T.O.

(B) Attempt any TWO :**8**

- (a) With the help of neat sketch, state working principle of Rotameter.
- (b) Draw constructional diagram of LVDT. State its working. What is residual voltage ?
- (c) State two advantages and two disadvantages of Radiation type level measurement.

2. Attempt any FOUR :**16**

- (a) State working principle of 'C' type Bourden tube with neat diagram.
- (b) Describe principle of operation of Doppler type ultrasonic flow meter with diagram.
- (c) Draw neat diagram of Gas filled thermometer. State its operating range and material used.
- (d) State need of level measurement. Also classify level measurement methods.
- (e) Define the terms :
 - (i) Analog and Digital transducer
 - (ii) Primary and secondary transducer
- (f) State two advantages and two disadvantages of Photoelectric pick-up speed measurement method.

3. Attempt any FOUR :**16**

- (a) Draw block diagram of instrumentation system. State function of each block.
- (b) Define :
 - (i) Absolute and Gauge pressure
 - (ii) Atmospheric and Vacuum pressure

- (c) Draw capacitance level gauge diagram. State its working.
- (d) Compare RTD and Thermistor with reference to material used, cost, operating range and application.
- (e) What is a Psychrometer ? Draw neat diagram of sling type hygrometer.
- (f) State comparison between PTC and NTC.

4. Attempt any FOUR :**16**

- (a) Describe working principle of ultrasonic level detector with diagram.
- (b) State selection criteria of transducer. (8 points)
- (c) Convert 200°F (Fahrenheit) into Celsius, Kelvin, Reaumur, Rankine scale.
- (d) State humidity measured using Hair hygrometer with neat diagram.
- (e) State Seebeck effect and Peltier effect. Write material used in different Thermocouples.
- (f) Name different non-elastic pressure transducers. Draw neat sketches of any two of them.

5. Attempt any FOUR :**16**

- (a) State two advantages and two disadvantages of Electromagnetic flow meter.
- (b) State working principle of Bimetallic thermometer with neat diagram.
- (c) State principle of operation of Piezo-electric transducer. State its application.
- (d) Compare Ultrasonic and Radar level measurement on basis of construction, waves used, application and cost.
- (e) Compare contact type and non-contact type speed measurement methods.
- (f) State how pressure measurement can be done using Dead Weight Tester.

6. Attempt any FOUR :**16**

- (a) Compare Active and Passive transducers. (4 points)
 - (b) Compare Capsule and Bellows with help of material used, construction, range of measurement, working principle.
 - (c) Compare orifice plate and ventury tube with reference to working principle, construction, maintenance and cost.
 - (d) Draw neat sketches of linear and rotary potentiometer liquid level gauges.
 - (e) Describe working optical pyrometer with neat diagram. Also write its operating range.
 - (f) What is strain gauge ? Compare Bonded and Un-bonded strain gauge.
-