

22477

23124

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) Compare active and passive transducers (any 2 points).
- (b) Define Temperature and give its units (any 2).
- (c) Draw a neat labelled diagram of capacitive pick-up for thickness measurement.
- (d) Give the specifications of photoelectric type proximity sensor (any two).
- (e) Define thickness and state its unit.
- (f) Draw inductive type proximity sensor required for measurement of position.
- (g) Classify the speed measuring sensors.

2. Attempt any THREE of the following :

12

- (a) Explain the speed measurement using magnetic pick-up.
- (b) Explain C-type bourdon tube with neat labelled diagram.
- (c) List different types of force meter and explain hydraulic force meter with diagram.
- (d) Convert 40 °C (Celsius) into (i) Kelvin (°K), (ii) Fahrenheit (°F) units.



- 3. Attempt any THREE of the following :** **12**
- (a) Classify the different types of transducers.
 - (b) Describe the working principle of filled system type thermometer.
 - (c) Suggest suitable method to measure thickness of newspaper with justification.
 - (d) Explain how proximity sensors are used as position sensors.
- 4. Attempt any THREE of the following :** **12**
- (a) State different temperature scales and state their conversion formulae.
 - (b) Compare capacitive and inductive pick-up for thickness measurement.
 - (c) List selection criteria for transducers (any 8 points).
 - (d) Explain the working principle of strain gauge load cell with neat labelled diagram.
 - (e) Explain the working principle of Biometallic thermometer with neat sketch.
- 5. Attempt any TWO of the following :** **12**
- (a) Compare U-tube manometer and well type manometer (any 4 points). Give limitations of U-tube manometer.
 - (b) Name the material used, sensitivity, temperature range of the J-type and K-type thermocouple.
 - (c) Explain camera based width measurement technique with neat labelled diagram.
- 6. Attempt any TWO of the following :** **12**
- (a) List different electrical transducers. Explain the construction of following transducers with neat sketch :
 - (i) Linear Potentiometer
 - (ii) Angular Potentiometer
 - (b) State different types of proximity sensors. Explain working principle of ultrasonic sensor and state its two applications.
 - (c) Convert 200 °F into :
 - (i) Celsius (°C)
 - (ii) Kelvin (°K)
 - (iii) Rankine (°R)
-