

17551

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any TEN :

10 × 2 = 20

- (a) Define Span and Range.
- (b) List the factors responsible for dead zone.
- (c) Write any four applications of displacement transducers.
- (d) Define the following terms related to potentiometer :
 - (i) Resolution
 - (ii) Noise
- (e) State any two advantages of bimetallic thermometer.
- (f) State different types of pressure thermometer.
- (g) State the advantages of PI control action.
- (h) State the applications of Rotameter.
- (i) State the advantages and disadvantages of turbine flowmeter.

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- (j) List any four metal alloys used for strain gauge sensing element.
- (k) State advantages of stroboscope.
- (l) Define control system with one example.
- (m) Give the applications of an automatic control systems.
- (n) State the limitations of open-loop control systems.

2. Attempt any FOUR :

4 × 4 = 16

- (a) Explain with a neat sketch generalised measurement system.
- (b) Define (i) Sensitivity (ii) Threshold (iii) Linearity (iv) Calibration.
- (c) Explain the piezo resistive type transducer. State its advantages.
- (d) Classify the errors and explain any two types of errors.
- (e) Compare active and passive transducers.
- (f) State advantages and limitations of thermocouple.

3. Attempt any FOUR :

4 × 4 = 16

- (a) Explain the working of LVDT with neat sketch.
- (b) Explain McLeod gauge with neat sketch.
- (c) State the specification of RVDT. State its advantages.
- (d) Explain Pirani gauge with neat sketch.
- (e) Explain the working principle of capacitive type of transducer with neat sketch for displacement measurement.
- (f) Explain the working of ultrasonic flowmeter.

4. Attempt any FOUR :**4 × 4 = 16**

- (a) Draw neat sketch of 'Rotameter' and explain its construction and working
- (b) Explain with neat sketch the working of hot wire anemometer.
- (c) Explain the working of electromagnetic flowmeter with neat sketch.
- (d) Compare Thermistor and RTD.
- (e) Explain with neat sketch platinum resistance thermometer.
- (f) Explain, electronic PID control action. State its disadvantages.

5. Attempt any FOUR :**4 × 4 = 16**

- (a) A thermometer has range 0 °C to 100 °C. It has accuracy of $\pm 1\%$ of full scale value. Find the error in reading of 73 °C.
- (b) Explain with neat sketch working of optical pyrometer.
- (c) State the laws of 'Intermediate temperature and intermediate metal' with neat sketches.
- (d) Explain with a neat sketch of sling Psychrometer.
- (e) Explain the working of capacitance type level meter.
- (f) Explain feed forward control system with neat diagram. State its advantages.

6. Attempt any FOUR :**4 × 4 = 16**

- (a) Explain with neat sketch the working of tool dynamometer.
- (b) Explain the working of drag cup tachometer with a neat sketch.
- (c) Explain wire type bonded strain gauge with a neat sketch.

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- (d) Compare hydraulic and pneumatic type of control system.
 - (e) Explain servomotor mechanism with neat block diagram.
 - (f) Explain the application of measurements and control for setup of air conditioners.
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