15116

3 Hours / 100 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.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any TEN of the following :**   **2 × 10 = 20**

(a) Define the term threshold and resolution.

(b) Explain overshoot in a measuring instrument.

(c) Define the term range and span.

(d) What is function of transducer ? Differentiate between active and passive transducer.

(e) What is thermoelectric effect ?

(f) Which instrument is used for measuring temperature of 1400 °C furnace and exhaust valve of engine ?

(g) State application of potentiometer and write its working principle.

(h) List any four low pressure measuring instrument. State its range.

(i) State working of hair hygrometer.

(j) What is strain gauge ? What are materials used for strain gauge ?

(k) State working principle of electromagnetic flow meter.

(l) Compare pneumatic and electronic control system.

(m) Draw the block diagram of automatic control system.

(n) State the significance of hysteresis in a measuring instrument.

P.T.O.

2. **Attempt any FOUR of the following :** **4 × 4 = 16**

(a) What are different types of errors in measurement system ? Give classification.

(b) Explain the working principle and application of resistive type and inductive type transducer.

(c) Differentiate between accuracy and precision with suitable example.

(d) Explain with neat sketch working principle of LVDT.

(e) Explain with neat sketch working of McLeod gauge.

(f) Explain pressure measurement using electrical resistance type working principle.

3. **Attempt any FOUR of the following :** **4 × 4 = 16**

(a) Write the specification for displacement transducer.

(b) Explain with neat sketch photoelectric pressure transducer.

(c) Explain construction and working of bimetallic thermometer.

(d) What is working principle of RTD ? Explain with necessary sketch.

(e) What is radiation pyrometer ? Explain working principle with neat sketch, also state its application.

(f) Explain working principle of thermistor. State its types.

4. **Attempt any FOUR of the following :** **4 × 4 = 16**

(a) Draw neat sketch of Rotameter and explain its working.

(b) Explain construction and working of hot wire anemometer.

(c) Explain turbine meter with necessary sketch.

(d) Explain sound measurement using electro-dynamic microphone.

(e) What is stroboscope ? Explain its working principle.

(f) Explain construction and working of inductive pick-up tachometer.

5. **Attempt any FOUR of the following :** **4 × 4 = 16**

(a) Explain working and application of bonded strain gauge.

(b) Explain feedback control system with block diagram and state its application.

(c) Explain control system for boiler setup.

(d)   Explain proportional and derivative type (PD) control action.

(e)   With a suitable example, explain servo motor mechanism.

(f)   What is feed forward control system ? Explain with suitable application.

6.   **Attempt any FOUR of the following :**   **4 × 4 = 16**

(a)   Explain integral control action.

(b)   Explain working of pressure thermometer.

(c)   What is ultrasonic flow measurement ? Explain its working principle with necessary figure.

(d)   Explain working principle of eddy-current dynamometer.

(e)   Explain control system for speed control of motor.

(f)   What is optical measurement scale ? Explain.

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