

313331

24225

3 Hours / 70 Marks

Seat No.

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- 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.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define sensor and give its any two examples.
- (b) Define :
 - (i) Linearity
 - (ii) Calibration
- (c) Draw inverting amplifier of IC741.
- (d) Write materials used for following sensor :
 - (i) LVDT
 - (ii) RTD
- (e) Draw neat & labelled diagram of venturimeter.
- (f) Write the materials used in MEMS devices.
- (g) Compare IR radiation sensor and ultrasonic sensor (any two points).

2. Attempt any THREE of the following :

12

- (a) Explain characters of sensors.
- (b) Draw and explain Op-Amp as integrator.



- (c) Draw the basic block diagram of measurement system and give the importance of signal conditioning circuit.
- (d) Explain the orifice plate and give its applications.

3. Attempt any THREE of the following : 12

- (a) Classify sensors and give any one example of each.
- (b) Draw and explain concept of linear variable differential transformer.
- (c) Describe the working of Hall effect sensor.
- (d) Explain MEMS accelerometer sensors.

4. Attempt any THREE of the following : 12

- (a) Describe the selection criteria for choosing of sensors (any four).
- (b) Describe the working of inverting amplifier with neat diagram.
- (c) Describe the characteristics of Op-Amp IC741 (any four).
- (d) Draw and explain working of C-shape Bourdon Tube Pressure Sensor.
- (e) Explain the concept of magnetic Bio-sensor with neat sketch.

5. Attempt any TWO of the following : 12

- (a) Explain the differential amplifier with neat labelled diagram.
- (b) Describe the operation of smart sensors with the help of block diagram.
- (c) Describe the working of resistive touch screen sensor and give its two advantages and two disadvantages.

6. Attempt any TWO of the following : 12

- (a) Enlist MEMS sensors for pressure measurement and explain working of any one.
 - (b) Draw and explain semi-conductor gas sensor.
 - (c) Draw neat labelled diagram of rotameter and explain its working.
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