



# 22332

11819

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.*  
(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. Attempt <b>any five</b> of the following :  | 10    |
| a) Define following :  | 2     |
| 1) Transducer  |       |
| 2) Sensor.   |       |
| b) State the working principle of elastic pressure transducer.                             | 2     |
| c) Define laminar and turbulent flow.  | 2     |
| d) List any four material used to construct RTD.   | 2     |
| e) State any two advantages and disadvantages of bimetallic thermometer.                   | 2     |
| f) Explain piezoelectric effect and list any two piezoelectric materials.                  | 2     |
| g) State any four objectives of data acquisition system.                                   | 2     |
| 2. Attempt <b>any three</b> of the following :   | 12    |
| a) Draw neat and labeled block diagram of instrumentation system.                          | 4     |
| b) With neat diagram, describe working of radiation type pyrometer.                        | 4     |
| c) Draw the block diagram of multichannel data acquisition system and explain its working. | 4     |
| d) Describe the working principle of 'C' type Bourdon tube.                                | 4     |

P.T.O.

**Marks**

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|--|-----------|
| <b>3. Attempt any three of the following :</b>   | <b>12</b> |
| a) Describe with neat diagram electronic pressure measurement system using bourdon tube and LVDT.  | 4         |
| b) Describe the need of cold junction compensation for temperature measurement using thermocouple. | 4         |
| c) Compare RTD and thermistor on the basis of temp. coefficient, linearity, temp. range and cost.  | 4         |
| d) List any four application of Data Acquisition System.   | 4         |
| <b>4. Attempt any three of the following :</b>   | <b>12</b> |
| a) Describe the working principle inclined tube manometer.   | 4         |
| b) Draw constructional diagram of float type level meter and describe its working.                 | 4         |
| c) Convert :   |           |
| a) 35°C into °F and °K   |           |
| b) 100°K into °C and °F.   | 4         |
| d) With neat labeled diagram, describe working of general telemetry system.                        | 4         |
| e) Describe the use of printer and recorder in Data Acquisition System.                            | 4         |
| <b>5. Attempt any two of the following :</b>   | <b>12</b> |
| a) List and describe any six criteria for selection of transducer for industrial application.      | 6         |
| b) 1) Compare strip chart recorder and analog X-Y recorder (Any 4 points).                         | 2         |
| 2) Draw a neat diagram showing basic element of LASER printer.                                     | 4         |
| c) 1) Describe with neat labeled diagram working principle of rotameter.                           | 4         |
| 2) Draw neat diagram of magnetic pick-up type speedometer.   | 2         |
| <b>6. Attempt any two of the following :</b>   | <b>12</b> |
| a) 1) Justify use of LVDT for measurement of linear displacement.                                  | 4         |
| 2) List any two application of capacitive transducer.  | 2         |
| b) 1) Describe the use of proximity sensor for distance measurement.                               | 2         |
| 2) Describe the use of photoelectric pick-up for speed measurement with neat diagram.              | 4         |
| c) Describe the procedure to calibrate pressure gauge using dead weight tester.                    | 6         |
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