



17561

14115

3 Hours/100 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) **Use** of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in **Examination Hall**.

**MARKS**

1. A) Attempt **any three** : **12**
  - a) Define :
    - i) Speed of response
    - ii) Accuracy.
  - b) List the temperature scales and give the icepoint and boiling point of water in each scale.
  - c) What is the difference between direct and indirect level measurement ? Give examples of two equipments in each type.
  - d) Give the principle of positive displacement flow meter.
- B) Attempt **any one** : **6**
  - a) Draw the diagram of dead weight tester and explain its principle and working.
  - b) Differentiate between open loop and closed loop control system.
2. Attempt **any four** : **16**
  - a) Draw the system input for :
    - i) Step
    - ii) Ramp
    - iii) Sinusoidal
    - iv) Pulse
  - b) Draw the diagram of strain gauge. Explain its principle.
  - c) Give the function of valve actuator and valve positioner.
  - d) Draw the block diagram for PLC architecture.
  - e) Give 2 applications each for PLC and DCS.
  - f) Explain the working of air to open control valve.

**P.T.O.**



3. Attempt **any four** : 16
- a) Define Seebeck effect and Peltier effect.
  - b) Give the principle of capacitive level measurement.
  - c) Explain the construction and working of bellows.
  - d) Explain the working of Piston type variable area meter.
  - e) Explain Cascade Control System.
4. A) Attempt **any three** : 12
- a) With the help of a diagram, explain the working of bimetallic thermometer.
  - b) Draw the diagram of RTD and mark the parts.
  - c) Explain the working of thermal flow meter.
  - d) Give the principle of magnetic flow meter.
- B) Attempt **any one** : 6
- a) What are the factors to be considered for valve selection ?
  - b) Explain DCS architecture with the help of block diagram.
5. Attempt **any four** : 16
- a) Give the advantages and disadvantages of electromagnetic flow meter (two each).
  - b) Name the method used for measuring the level of corrosive and abrasive liquids. Explain its working.
  - c) Explain with diagram, pressure gauge method for liquid level measurement.
  - d) Draw a labelled diagram of McLeod gauge. Give its principle.
  - e) Convert 10 atm into :
    - i) Pa
    - ii) bar
    - iii) mm of Hg
    - iv)  $\text{Kg}_f/\text{cm}^2$ .
6. Attempt **any two** : 16
- a) Describe the working of pneumatic PID controller.
  - b) Explain the different valve characteristics.
  - c) What are the elements of computer aided process control hardware ? Explain.
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