

# 17561

**21819**

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

**Marks**

1. a) Attempt any THREE of the following: 12
- (i) Define:
- 1) Accuracy
  - 2) Precision
  - 3) Sensitivity
  - 4) Repeatability.
- (ii) Differentiate between variable head meter and variable area meter. Give one example each.
- (iii) List different direct methods for liquid level measurement. Describe any one of it in detail.
- (iv) What do you mean by servo and regulatory operations? Give one example each, where these operations are adopted.

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- b) **Attempt any ONE of the following:** **6**
- (i) What is the principle of positive displacement flow meter? Describe the working of rotating vane meter, with neat diagram.
  - (ii) Describe the construction and working of radiation pyrometer with neat sketch give its applications.
2. **Attempt any FOUR of the following:** **16**
- a) Describe the working of turbine flow meter with neat sketch.
  - b) With neat diagram, explain the working of strain gauge.
  - c) List different element of an instrument. Give one example each.
  - d) Draw the neat diagram of C type bourdon tube. Give its advantages and disadvantages.
  - e) Convert following of values to °K:
    - (i) 77°f
    - (ii) 113°f.
  - f) Explain different types of input that can be given to control system.
3. **Attempt any FOUR of the following:** **16**
- a) With neat diagram, describe pressure gauge method for liquid level measurement.
  - b) Give two applications each of:
    - (i) Ultrasonic flowmeter
    - (ii) Turbine flowmeter.
  - c) Describe air to open and air to close control valve. Which types of control valve you will suggest for hazardous system?
  - d) State 'seeback effect'. Give names of any two thermocouples with their temperature range.
  - e) Explain how bellows are used for measurement of differential pressure.
  - f) State any four features of distributed control system.

- 4. a) Attempt any THREE of the following:** **12**
- (i) Describe the working of bimetallic thermometer with neat diagram.
  - (ii) Write the steps involved in calibration of pressure gauge by dead weight tester.
  - (iii) Draw the block diagram of closed loop control system.
  - (iv) Draw block diagram of programmable logic controller.
- b) Attempt any ONE of the following:** **6**
- (i) With neat diagram explain construction and working of any one method for solid level measurement.
  - (ii) Draw the neat diagram of Mc-Leod gauge. Explain its working.
- 5. Attempt any FOUR of the following:** **16**
- a) Define valve characteristics. Draw linear equal % and quick opening valve characteristics.
  - b) With neat sketch, describe the working of ultrasonic flow meter.
  - c) State and describe any four factors for selection of control valve.
  - d) Give the application programmable logic controller and DCS.
  - e) Describe air purge method for liquid level measurement.
  - f) Describe the working of electro magnetic flow meter.
- 6. Attempt any TWO of the following:** **16**
- a) Describe different control actions of control system with equation.
  - b) What is the role of valve actuator. Describe the working of valve actuator with neat diagram?
  - c) With neat sketch, describe the working of distributed control system in process industries.
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