

314336

24225

3 Hours / 70 Marks

Seat No. 

--	--	--	--	--	--	--	--

- 
- 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 any FIVE of the following :** **10**
- a) Draw the block diagram of feedback control system.
  - b) Differentiate between single - effect and multi - effect evaporator w.r.t. any two points.
  - c) Explain the concept of “Live zero”.
  - d) Interpret the ingress protection code IP 65.
  - e) State the need of valve positioners. (Any two points)
  - f) Draw the labelled diagram of double drum dryer.
  - g) Draw the scheme of 3-element feedwater control in boilers.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Draw the inherent flow characteristics of valve and explain in brief.
  - b) Draw the diagram and explain the operation of distillation column.
  - c) Differentiate between normal and burst mode of communication in HART with respect to any four points.
  - d) Give the classification of hazardous areas into classes and groups.
- 3. Attempt any THREE of the following :** **12**
- a) Explain any four types of NEMA enclosures.
  - b) Differentiate between the following w.r.t. any two points each.
    - i) Single seated valve  
Double seated valve
    - ii) Direct acting valve actuator  
Reverse acting valve actuator
  - c) Draw the typical layout of control room. State any two ergonomic considerations.
  - d) Explain split range control system with the help of an example.
- 4. Attempt any THREE of the following :** **12**
- a) Draw the schematic diagram of ratio control system. Explain its working.
  - b) Explain any four safety interlocks in boilers.
  - c) Define control valve coefficient. Explain any four selection factors of control valve.
  - d) Draw and explain the block diagram of SMART transmitter.
  - e) Draw the circuit of zener barrier w.r.t. intrinsic safety and explain its working.

**5. Attempt any TWO of the following :****12**

- a) Differentiate between cavitation and flashing. Explain the methods to minimize cavitation.
- b) Explain any three methods of hazardous area protection.
- c) Draw the diagram and explain.
  - i) Feed back
  - ii) Cascade control scheme for heat exchanger.

**6. Attempt any TWO of the following :****12**

- a) Explain cascade control with the help of block diagram. List its application. (Any two)
  - b) Draw the architecture of foundation field bus and explain it.
  - c) Draw the control scheme (feedback) to control the purity of distillate or top product in distillation column.
-