

22591

22232

3 Hours / 70 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

10

- (a) Draw P & ID symbol of Pneumatic signal and electric signal.
- (b) Draw the labelled block diagram of Feedback Control Scheme.
- (c) List any four examples of Unit operation.
- (d) State any two differences between Fuzzy set and Crisp set.
- (e) Decode IP 34.
- (f) State the S/L levels from lowest to highest level of safety.
- (g) List any two properties of Fuzzy set.

2. Attempt any THREE :

12

- (a) Explain the construction of a solenoid valve with labelled diagram.
- (b) Draw and explain Feedforward Control Scheme.
- (c) Define LOPA. Describe with an example.
- (d) Describe any four basic Fuzzy set operations.



- 3. Attempt any THREE :** **12**
- (a) State the need of live zero. List the standard signal range for pneumatic and electric transmission based on any two points.
 - (b) Describe selective control with the help of suitable application.
 - (c) State the principle of plate type heat exchanger. Explain its operation with suitable diagram.
 - (d) Define intrinsic safety. Describe intrinsic safety using zener barrier for hazardous areas with circuit diagram.
- 4. Attempt any THREE :** **12**
- (a) Explain the flow characteristic of control valve with diagram.
 - (b) Draw a neat labelled diagram of Cascade Control Scheme and explain it.
 - (c) State the need of safety interlocks in boiler. Describe any two safety interlocks in boiler.
 - (d) Explain hazardous area classification as per IEC standard.
 - (e) Draw the block diagram of Fuzzy control logic and explain in brief.
- 5. Attempt any TWO :** **12**
- (a) Draw a neat labelled block diagram of SMART transmitter. List its salient features.
 - (b) State the principle of boiler process. Describe the Feed back Control Scheme of boiler with diagram.
 - (c) Describe with block diagram how Fuzzy Cruise Controller can be implemented.
- 6. Attempt any TWO :** **12**
- (a) Describe the Feed Forward Control Scheme of heat exchanger with diagram.
 - (b) Define hazardous area. List and explain any two protection methods used in hazardous area.
 - (c) List and describe different Fuzzy membership functions.
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