

17540

11920

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) Assume suitable data, if necessary.
 - (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**

- (i) Draw the block diagram of process control system. Explain each block in brief.
- (ii) State the standard transmission range of electronic and pneumatic systems. Describe the significance of 'live-zero'.
- (iii) Explain I to V converter with diagram.
- (iv) Draw the diagram of X-Y recorder. Label the parts.

(B) Attempt any ONE : **6**

- (i) Draw neat sketch of Flapper-nozzle mechanism and explain its working in brief.
- (ii) State any two applications of DAS. Draw and explain Multichannel DAS.

2. Attempt any TWO :**16**

- (a) Explain the working of electronic force balance type pressure transmitter with neat diagram.
- (b) List the types of control panels. Draw the diagram of any one type of panel. Describe any two documents required for designing the control panel.
- (c) State the significance of alarm annunciator in the process industry. Draw the schematic diagram of a typical alarm annunciator. Describe its operational sequence.

3. Attempt any FOUR :**16**

- (a) Explain the following terms with example :
 - (i) Manipulated variable
 - (ii) Controlled variable.
- (b) Explain pressure to current converter with diagram.
- (c) Explain the meaning of following :
 - (i) IP 33
 - (ii) IP 65
 - (iii) IP X3
 - (iv) IP 42
- (d) Describe the working of strip chart recorder with diagram.
- (e) Explain zener barrier protection method used in hazardous area with diagram.

4. (A) Attempt any THREE : 12

- (i) List four types of process characteristics. Describe any one.
- (ii) Explain the need of converters in process system. List 4 types of converters used in process industry.
- (iii) Draw a general layout of control room. List any two ergonomic considerations of it.
- (iv) Explain the explosion proofing protection method of hazardous area.

(B) Attempt any ONE : 6

- (i) Define calibration. Draw and explain any one method to calibrate a transmitter.
- (ii) Draw the block diagram of data logger and explain its working.

5. Attempt any TWO : 16

- (a) Draw the block diagram of SMART transmitter. Describe each block. State any features of SMART transmitter.
- (b) Compare with the neat sketches
 - (i) Flat type control panel
 - (ii) Break front type control panel.
- (c) Define the term hazardous area. Give the classification of hazardous area in detail.

6. Attempt any FOUR :**16**

- (a) List any two types of process dynamics. Explain them briefly.
 - (b) Describe HART communication protocol in brief.
 - (c) Describe V to I converters with diagram.
 - (d) Differentiate between DAS and Data logger (any two points). Write two applications of data logger.
 - (e) Classify the following into appropriate hazardous areas :
 - (i) Wheat
 - (ii) LPG
 - (iii) Acetylene
 - (iv) Coal
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