

17540

21819

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) Assume suitable data, if necessary.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

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| <b>1.</b> | <b>(A) Attempt any THREE of the following :</b>  | <b>12</b>    |
|           | (a) Define the term process control system. Draw a neat labelled diagram of process control system.  |              |
|           | (b) Draw and explain the working of flapper-nozzle amplifier. Draw its characteristics.  |              |
|           | (c) Draw and explain pressure to current converter.  |              |
|           | (d) State any three advantages of graphic panels.  |              |
|           | <b>(B) Attempt any ONE of the following :</b>  | <b>6</b>     |
|           | (a) Define the term SMART transmitter. Draw the block diagram of a SMART transmitter and explain each functional block.                      |              |
|           | (b) Name the standards for enclosure classification used for electrical equipments. Define IP classification and decode the following codes. |              |
|           | (i) IP × 4   | (ii) IP56    |

- 2. Attempt any TWO of the following :** **16**
- (a) Draw a neat diagram of force balanco type DP transmitter and explain its working.
  - (b)
    - (i) Give the classification of control panels. Explain break front panel.
    - (ii) Explain the design considerations of control room.
  - (c) List the methods adopted to reduce the chances of protection in industrial area (any six). Explain Intrinsic safety. Explain any one method of making an equipment / circuit intrinsically safe.
- 3. Attempt any FOUR of the following :** **16**
- (a) Name the different process dynamics. Explain any one with necessary diagram.
  - (b) Differentiate between electronic and pneumatic transmission.
  - (c) Explain the need of signal converter. Give an example.
  - (d) Daw the setup of a X-Y recorder and explain its working.
  - (e) State the IEC classification of industrial area.
- 4. (A) Attempt any THREE of the following :** **12**
- (a) Define the following terms :
    - (i) Controlling variable
    - (ii) Process load
  - (b) Draw and explain I/V converter.
  - (c) State the objectives of a DAS.
  - (d) Differentiate between Hazardous group and Lazardous class. Explain the need of alarm annunciator.

**(B) Attempt any ONE of the following :****6**

- (a) Draw the diagram of a temperature transmitter using 4 wire RTD. Explain its working. State the advantage of 4 wire RTD with other configurations.
- (b) Classify hazardous area for the following :
  - (i) Aluminium dust
  - (ii) Hydrogen
  - (iii) Hard Coal Kentucky bituminous
  - (iv) Wheat
  - (v) LPG
  - (vi) Methane

**5. Attempt any TWO of the following :****16**

- (a)
  - (i) State the standard ranges of signal transmission.
  - (ii) State the benefits of foundation field bus protocol.
- (b)
  - (i) Draw the block diagram of data logger and explain each block.
  - (ii) Compare DAS and data logger.
- (c)
  - (i) State the sequence of operation for alarm annunciator. Explain any one sequence.
  - (ii) Explain explosion proofing.

**P.T.O.**

6. Attempt any **FOUR** of the following :

16

- (a) Draw and explain the set-up of flow control through a pipeline.
  - (b) Draw and explain strip chart recorder. State its disadvantages.
  - (c) State the specifications of control panel.
  - (d) Draw and explain multi-channel DAS with digital multiplexing.
  - (e) Draw and explain a voltage to current converter.
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