



17540

21718

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) Illustrate your answers with neat sketches **wherever** necessary.
 - (2) Figures to the **right** indicate **full** marks.
 - (3) Assume suitable data, if **necessary**.
 - (4) Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.

- | | Marks |
|---|--------------|
| 1. A) Attempt any 3 : | 12 |
| a) List different process characteristics. Describe any one in brief. | |
| b) State the need of signal transmission. State the standard range for pneumatic signal transmission. | |
| c) Draw the diagram of voltage to current convertor and explain. | |
| d) Describe single channel DAS with diagram. | |
| B) Attempt any 1 : | 6 |
| a) Draw and explain pressure to current converter. | |
| b) Draw and explain data logger. State its use. | |
| 2. Attempt any 2 : | 16 |
| a) Draw the diagram of force balance pressure transmitter. Explain its working. | |
| b) Draw general layout of control room. Describe six ergonomic considerations of it. | |
| c) State the need of recorders. Draw and explain X-Y recorder. | |
| 3. Attempt any four : | 16 |
| a) Describe explosion proof method of protection used in hazardous area. | |
| b) Give the meaning of IP 65 and IP 56. | |
| c) Draw the architecture of foundation field bus. State any 2 features of it. | |
| d) Differentiate between strip chart and XY recorder. (4 points) | |
| e) Draw and explain V/I convertor. | |

P.T.O.

**Marks**

- 4. A) Attempt any 3 :** **12**
- a) List different types of process dynamics. Explain any one.
 - b) Draw and explain current to voltage convertor.
 - c) Classify the following materials into appropriate hazardous area :
1) LPG 2) Acetylene 3) Wheat 4) Coal.
 - d) Describe HART communication technique used in digital transmission.
- B) Attempt any 1 :** **6**
- a) Define calibration. Describe method for pressure transmitter calibration.
 - b) Define intrinsic safety. Draw and explain the Zener barrier circuit for intrinsic safety.
- 5. Attempt any 2 :** **16**
- a) State the need of control panel. State the types of control panels. Explain any four documents needed to design the control panel.
 - b) Explain SMART transmitter with the help of diagram. State four features of it.
 - c) List types of alarm annunciator. Draw the schematic diagram. Describe its operational sequence.
- 6. Attempt any four :** **16**
- a) Draw the block diagram of multi channel DAS. Explain its working.
 - b) Draw the block diagram of process control system. Define :
1) Manipulated variable
2) Controlled variable.
 - c) Give the meaning of
1) NEMA 12
2) NEMA 67.
 - d) Define Hazardous area. State its classification based on probability of a material to be present.
 - e) List four examples of process control system. Draw the block diagram for any one of them.
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