



# 17540

11718

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) *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.*
  - (8) *Use of Steam tables, logarithmic, Mollier's chart is **permitted**.*

**Marks**

1. A) Attempt **any 3** : **12**
  - a) List 3 different types of process characteristics. State the meaning of any one.
  - b) Define calibration. State the need of calibration of instruments. (any 2 points).
  - c) State the need of converters in process industry (any 2 points).
  - d) State the need and applications of recorders in process industries.

B) Attempt **any one** : **6**

  - a) Draw the diagram of pressure to current converter. Explain in brief.
  - b) Draw the diagram of strip chart recorder. Explain its working.
2. Attempt **any 2** : **16**
  - a) Draw the neat diagram of force balance type pressure transmitter. Explain its working.
  - b) Describe any four documents required for designing the control panel in detail.
  - c) Name the protection methods used in hazardous area. Define intrinsic safety. Explain how it can be achieved with zener barrier.
3. Attempt **any 4** : **16**
  - a) List 3 different types of process dynamics. State the meaning of any one.
  - b) State the need of DAS. Name the types of DAS. State any 2 applications of DAS.
  - c) Give the meaning of IP 34 and 65.

**P.T.O.**



d) Classify the following materials into appropriate hazardous area of class and group.

- 1) Acetylene
- 2) Aluminium dust.

e) Draw the block diagram of Data logger and explain its working.

**4. A) Attempt any 3 :**

**12**

- a) State the ranges of standard signals of pneumatic and electronic transmission system. State the significance of live zero.
- b) Draw and explain voltage to current converter. State its significance.
- c) State the need of control panels in process industry (any four).
- d) Explain how explosion proofing method of protection is used in hazardous area.

**B) Attempt any one :**

**6**

- a) Draw the neat diagram of electronic temperature transmitter. Explain its working in detail.
- b) Draw the block diagram of XY recorder. Explain its working.

**5. Attempt any 2 :**

**16**

- a) Draw the block diagram of SMART transmitter. Explain its working. State any 2 features of SMART.
- b) What is Alarm Annunciator ? List its different types, also mention its operational sequence in different modes.
- c) a) Discuss the different requirement of design of control panel. Draw the front view of flat panel.  
b) Explain any four NEMA types of enclosures.

**6. Attempt any 4 :**

**16**

- a) Draw the diagram of flapper-nozzle mechanism. Explain its working.
  - b) Draw the block diagram of process control system. Explain each block.
  - c) Explain the HART protocol for digital communication.
  - d) State any 4 environmental consideration of a control room.
  - e) Draw the architecture of foundation field bus. Explain in brief.
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