

# 315399

**12526**

**3 Hours / 70 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.

**Marks**

- 1. Attempt any FIVE of the following :** **10**
- a) State the concept of an intelligent building.
- b) List the types of CCTV camera.
- c) State any two objectives of safety policies used in BAS.
- d) State the difference between air handling unit (AHU) and fan coil unit (FCU) used in HVAC system. (Two points)
- e) List any two features of optimal control in FMS.
- f) State any four air properties used to draw the psychrometric chart.
- g) State the role of intelligent network devices used in FMS.

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- 2. Attempt any THREE of the following :** **12**
- a) List the basic components used in access control system. State the benefits of access control system.
  - b) Explain energy management system used in building automation.
  - c) Explain working of chiller system in HVAC with neat diagram.
  - d) Draw hierarchical configuration of controllers in BAS and explain in brief.
- 3. Attempt any THREE of the following :** **12**
- a) Explain the types of boilers used in HVAC system.
  - b) Explain any two DDC operators in brief.
  - c) Differentiate between DVR and NVR system. (Four points)
  - d) Explain the use of time scheduling feature in FMS.
- 4. Attempt any THREE of the following :** **12**
- a) Enlist any four features of a typical BAS. State any four applications of BAS.
  - b) Explain the architecture of FAS with neat diagram.
  - c) Explain any four DDC operators available in DDC BAS system.
  - d) Explain alarm reporting and trending as a feature in FMS.
  - e) Explain the routing maintenance activities required for an efficient HVAC system.

**5. Attempt any TWO of the following : 12**

- a) Explain video management system in CCTV. List steps to integrate video surveillance system.
- b) Describe the following features for information management in FMS –
  - i) Summaries
  - ii) Pass word
  - iii) Totalization
- c) Suggest suitable communication protocol and media and explain it in brief with respect to DDC used in BAS.

**6. Attempt any TWO of the following : 12**

- a) Explain the design and realization of automatic lighting control and biometric authentication assuming suitable components.
  - b) Draw human comfort zone on psychrometric chart. Assume suitable data and explain ventilation (air mixing) process in HVAC with suitable example using psychrometric chart.
  - c) State the function of FAS components;
    - i) Fire and smoke detector
    - ii) Smart sensor
    - iii) Fire alarm control panel
    - iv) Annunciator panel
    - v) Supression system
    - vi) Notification devices
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