

315373

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) 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.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) Define Dew point depression.
- b) State any four requirement for installation for HVAC.
- c) Represent cooling with Dehumidification process on psychrometric chart.
- d) State Dalton's law of partial pressure.
- e) Classify the compressor used in Refrigeration.
- f) What is the necessity of cooling load calculation.
- g) Give the classification of duct on the basis of supply and cross section.

P.T.O.

- 2. Attempt any THREE of the following : 12**
- a) Compare the Hermetically sealed compressor with open type reciprocating compressor on following basis –
 - i) Construction
 - ii) Capacity
 - iii) Application
 - iv) Lubrication and maintenance
 - b) Describe working of flooded type evaporator with neat sketch.
 - c) What is sensible heating of Air ? Represent sensible heating process on psychrometric chart.
 - d) Justify, the capillary tube is used in all domestic appliances as an expansion device.
- 3. Attempt any THREE of the following : 12**
- a) State four desirable properties of insulating material used in air conditioning.
 - b) Draw layout of Automobile air conditioning system.
 - c) Differentiate between central and unitary air conditioning system.
 - d) Illustrate with neat sketch the working of year round air conditioning system.
- 4. Attempt any THREE of the following : 12**
- a) Define sensible heat and latent heat gains. List the sources of sensible heat gain.
 - b) Describe how occupant load is calculated.
 - c) Enlist any four type of duct material used in air conditioning. State any four desirable properties of duct material.
 - d) Draw layout of extended plenum system and explain it.
 - e) Describe 'Grills' and Registers and state any two functions of it.

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

- a) With the help of psychrometric chart, Find the following properties of air if air at 26°C DBT and 60% relative humidity.
- Dew Point Temperature
 - Wet Bulb Temperature
 - Enthalpy of Air
 - Specific Humidity
- b) Explain with neat sketch the working of thermostatic expansion valve and write two application of it.
- c) Explain summer air conditioning system with neat sketch for cold and dry outdoor conditions.

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

- a) To calculate the cooling loads of a class - room. Explain the various cooling load and calculations involved in it.
- b) Enlist different types of fans used in air conditioning system. Explain anyone with a sketch.
- c) A rectangular duct 0.15 m × 0.12 m is 20 m long and carries standard air at the rate of 0.3 m³/s. Find total pressure required at the inlet to the duct in order to maintain this flow and air power. $f = 0.005$.
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