

22653

23124

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) Define controlled ventilation.
- (b) State difference between upstream and downstream blower.
- (c) State four precautions to be taken while operating car A/C.
- (d) List different types of sensor used in automobile air conditioning system.
- (e) State different types of connectors used in automobile air conditioning system.
- (f) Mention types of heating system used in automobiles.
- (g) State function of heating core used in automobile heating system.

**2. Attempt any THREE of the following :**

**12**

- (a) Explain with P-V diagram vapour compression refrigeration cycle.
- (b) Illustrate with sketch air intake section of case and duct system.
- (c) Draw a layout of air conditioning system used in car.
- (d) Explain with neat sketch working of electronic temperature control system.
- (e) Explain with justification comfort heating system.



- 3. Attempt any THREE of the following : 12**
- (a) Describe following modes of heat transfer :
    - (i) Convection (ii) Radiation
  - (b) Illustrate with sketch the use of independent case system with upstream blower.
  - (c) List four refrigerants with their color code.
  - (d) Explain with sketch construction & working of high pressure switch.
- 4. Attempt any THREE of the following : 12**
- (a) Explain working of thermostatic expansion valve with neat sketch.
  - (b) Explain the use of following A/C control devices :
    - (i) Aspirator (ii) Blower clutch control
  - (c) Describe the procedure of leak testing by using halide leak detector.
  - (d) Explain with sketch purpose of charging & discharging of refrigerant carried out in A/C system.
- 5. Attempt any TWO of the following : 12**
- (a) Explain the following human comfort factors in relation to automobile air conditioning :
    - (i) Comfort zone (ii) Wind chill factor (iii) Odour
  - (b) Explain the functions of expansion valve –
    - (i) Throttling action (ii) Modulating action (iii) Controlling action
  - (c) State and explain general preventive maintenance steps for car A.C. system.
- 6. Attempt any TWO of the following : 12**
- (a) Explain construction & working of vacuum restrictor with neat sketch.
  - (b) List different types of compressor & explain with sketch scroll type compressor used in A/C system.
  - (c) Explain with sketch purpose of following types of hoses :
    - (i) System hose (ii) Charging hose
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