17620

21819

3 Hours /100 Marks Seat No. | | | | | | | | |

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. (A) Attempt any THREE : **12**

(a) Write the major safety aspects in HVAC system.

(b) State the function of duct system. Give its classification. Name the duct system used in heavy passenger vehicles.

(c) State the functions of -

(i) Thermostatic expansion valve

(ii) Fixed orifice tube

(iii) Accumulator

(iv) Receiver

(d) Explain the construction and working of Electromagnetic clutch.

(B) Attempt any ONE : **06**

(a) List the factors which controls the human comfort. Explain the importance of comfort zone with comfort chart.

(b) Draw the layout of automotive air-conditioning system. Name the components and explain its working.

2. Attempt any FOUR : **16**

(a) What is controlled ventilation ? Give its application.

(b) Explain the construction and working of Air intake section.

(c) Explain the construction and working of Thermostatic expansion valve.

(d) Which type of condenser is used in car air-conditioning system ? Explain its working in brief.

(e) State the function of metering devices. Explain the working of fixed orifice tube.

(f) Compare the internally equalized valve with externally equalized valve.

3. Attempt any FOUR : **16**

(a) State the requirements for HVAC system for heavy passenger vehicles.

(b) Compare the downstream duct system with upstream duct system.

(c) Name the compressor used in car air-conditioning system. Explain its working with neat sketch.

(d) Describe the term of modulating and controlling action as a function of thermostatic expansion valve.

(e) List the different control systems used in HVAC system of vehicle. Explain the climate control system.

4. (A) Attempt any THREE : **12**

(a) Explain the mode of heat transfer, by which heat is transferred in car air-conditioning system.

(b) State the refrigerant used in car air-conditioning system. Give the colour codes used for different refrigerants in practice. State its significance.

(c) State the function and location of high side & low side temperature switches.

(d) List the different equipments and tools used in repair and maintenance of HVAC system of vehicles.

(B) Attempt any ONE : **06**

(a) For a particular car air-conditioning system, how will you select the refrigerant ?

(b) Write the function and location of following :

(i) Sun load sensor

(ii) Outside temperature sensor

(iii) Car temperature sensor

5. Attempt any FOUR : **16**

(a) Explain the construction and working of rear heating system.

(b) Explain the role of blower clutch control and heater control in automotive air-conditioning system.

(c) Explain the electronic climate control system with block diagram.

(d) How will you carry out the following test in automotive air-conditioning system ?

(i) Leak Test (ii) Temperature test

(e) Explain the moisture removal procedure used while servicing the A/c system.

(f) State the function of comfort heating system. Explain its construction & working with block diagram.

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6. Attempt any FOUR : **16**

(a) Explain the construction and working of remote bulb.

(b) List the vacuum operated devices used in control system. Give the function and location of check valve and check relay.

(c) State the functions of :

(i) Halide torch

(ii) Nitrogen leak tester

(iii) Gauge calibration recovery unit

(iv) Vacuum pump

(d) List the common faults occurred in compressor of car A/c. Suggest the remedies over it.

(e) List the common faults occurred in comfort heating system. Suggest remedies over it.
