B. Tech III Year II Semester Examinations, April/May - 2012
AUTO AIR CONDITIONING
(AUTOMOBILE ENGINEERING)

Time: 3 hours Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. What are the advantages of vapour compression refrigeration cycle and explain the working details of the system and each part included? [15]

2. Sketch the comfort chart and explain what the factors that affect effective temperature are. Also explain the comfort zone and its technical details. [15]

3. Explain the work done by a reciprocating compressor with clearance volume and explain what is meant by hermetically sealed compressor with the help of diagram. [15]

4. What are the factors to be considered for calculating the cooling load on the vehicle cooling and explain them in detail? [15]

5. What three systems are included in a visual inspection of air conditioner, and how is each inspection performed? [15]

6. With the help of a line diagram, explain the location and operational details of ventilating and heating of the passenger compartment. [15]

7. What are the possible heater system troubles and how to diagnose the problem and explain the steps involved in detail. [15]

8. When refrigerant compressor is in trouble, how to detect it and how do you determine the amount of refrigerant oil that should be in the new compressor? Explain in detail. [15]
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1. Derive the equation for COP of vapour compression refrigeration system and explain the methods to improve the same. [15]

2. Explain the sensible heat factor and Bypass factor for cooling coils. Explain the significance of Room sensible heat factor with the help of psychrometric chart. [15]

3. With the help of line diagram, explain the working principle of evaporative condenser and explain the types of cooling towers along with working principle. [15]

4. Which are the Refrigerants used for automobile air conditioning and what are the required properties of the desirable refrigerants? Explain in detail? [15]

5. Describe how to make a performance test of an air conditioner of the automobile and comment on the results of the same. [15]

6. Explain in detail the auxiliary rear heating and cooling of a car with the help of neat sketch. [15]

7. How to test the vacuum control system and also explain the replacing of heater system components with the help of line diagrams? [15]

8. If refrigerant is leaking in the automobile, explain the methods to identify and how to recharge the system? [15]
1. What is meant by TTR and COP of the VCR system? Explain what is meant by sub cooling and super heating and explain their advantages. Show them on p-v and T-S diagrams. [15]

2. Differentiate between RHIF and GSHF and explain the Room design conditions and show them on the psychrometric chart. [15]

3. Draw the neat diagram of Flooded evaporator and explain its working details. Also differentiate the working of dry expansion evaporators. [15]

4. What is meant by Good refrigerant? What is the method of nomenclature of the refrigerant? What are the thermo physical properties of a refrigerant? [15]

5. Explain how to check the Refrigerant system pressures, and the conditions indicated by the pressures that are too high and too low. [15]

6. What are the materials used for ducting and show the schematic representation of ducting in the automobile car. Also explain the function of filters. [15]

7. Explain how the Refrigerant is being charged to the automobile with the help of line diagram and what are the safety cautions for air conditioning service. [15]

8. In case of emergency, explain the method of compressor trouble shooting and how to service the same in detail. [15]

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1. Explain the different coordinates of P-H and T-S diagrams and draw the simple VCR system indicating different ranges and show the working with P-H and T-S diagrams.
   [15]

2. With the help of psychometric chart, explain the different processes like sensible heating, sensible cooling, cooling and humidification and heating and humidification.
   [15]

3. Explain the working details of Thermostatic expansion valve with the help of neat sketch and explain different filters used in the air conditioning applications.
   [15]

4. How to calculate the cooling load on the automobile and based on that load, how to select the different components like compressor, evaporator and condenser?
   [15]

5. Explain in detail the working/operational details of the automatic heater system and how to change the position again back to air conditioner.
   [15]

6. What is the purpose of a blower? Explain its working with line diagram and its power consumption details. Explain the functional details of Registers and grills.
   [15]

7. What are the enemies of air conditioner in an automobile and explain their effect in detail and also explain the measures to curtail them?
   [15]

8. What are the different repairs that can be done on compressors and how to remove the seal and to check the oil level? Explain in detail.
   [15]