

FACULTY OF ENGINEERING
B.E. 3/4 (AE) II-Semester (Main) Examination, May 2013

Subject : Automotive Air Conditioning

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Explain, what do you understand by the term “Air conditioning”. (2)
2. Represent the following processes on psychrometric chart (2)
 - (a) Cooling and dehumidification
 - (b) Adiabatic dehumidification
3. Define Apparatus dew point. (2)
4. Explain the methods of estimating heat gain due to infiltrated air. (3)
5. Name the different types of expansion devices. (2)
6. What is sub cooling and super heating? (3)
7. How do you classify refrigerants? (3)
8. Define tonne of refrigeration and COP. (2)
9. Name the different types of ducts. (3)
10. What is Hermatic sealed compressor. (3)

PART – B (5x10=50 Marks)

11. 800m³/min of recirculated air at 22°C DBT and 10°C DPT is to be mixed with 300m³/min of fresh air at 30°C DBT and 50% RH. Determine the enthalpy, specific volume, humidity ratio and dew point temperature of the mixture.
- 12.(a) Explain the different processes involved in vapour compression refrigeration system along with p-h and T-s diagrams.
 (b) The amount of air supplied to an air conditioning hall is 300m³/min. The atmospheric conditions are 35°C DBT and 55% RH. The required conditions are 20°C DBT and 60% RH. Find out the sensible heat and latent heat removed from the air per minute. Also find sensible heat factor for the system.
13. Explain the method to estimate the cooling load on the air conditioning unit of an A/C system with suitable examples.
14. Explain how a compressor clutch works and describe its importance in synchronizing the speed of the automobile engine.
15. Differentiate among flame leak detector, electronic leak detector and fluid leak detector for the measurement of refrigerant leakages.
16. Explain about ford-air conditioning system and general motor air conditioning system, with suitable sketches.
17. Write short notes on the following:
 - (a) Service and maintenance of air conditioning system
 - (b) Ducts and filters
 - (c) Properties of moist air