No. of Printed Pages : 4

BME-032

DIPLOMA IN MECHANICAL ENGINEERING/ ADVANCED LEVEL CERTIFICATE COURSE IN MECHANICAL ENGINEERING (DMEVI/ACMEVI)

05465

Term-End Examination
June, 2012

BME-032 : REFRIGERATION AND AIR-CONDITIONING

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **five** questions in all. Question No. 1 is **Compulsory**. Answer four more questions from the remaining five questions. Assume missing data if any. Use of calculator is **allowed**.*

1. (a) By keeping the door of a refrigerator open for some time, the following effect is caused. **2x7=14**
   (i) The room will be cooled.
   (ii) The room temperature will be increased.
   (iii) There is no change in the room temperature.
   (iv) None of the above.

   (b) The C.O.P. of Carnot refrigerator is :

   (i) $\frac{T_1}{T_1-T_2}$ (ii) $\frac{T_1}{T_2-T_1}$

   (iii) $\frac{T_2}{T_1-T_2}$ (iv) $\frac{T_2}{T_2-T_1}$

(c) The cooling of or removal of heat from a system is known as _____.

(i) Refrigeration

(ii) Air conditioning

(iii) Condensation

(iv) Compression

(d) The C.O.P of an air refrigeration system is _____ than a vapour compression system.

(i) Less (ii) More

(e) The most common refrigerant used in the vapour compression refrigeration is _____.

(i) CO_2 (ii) CO

(iii) R - 11 (iv) H_2SO_4

(f) CCl_2F_2 is the chemical formula for

(i) Ammonia

(ii) Sulphur dioxide

(iii) Refrigerant R-13

(iv) Refrigerant R-12

(g) During sensible cooling, wet bulb temperature

(i) decreases

(ii) increases

(iii) remains constant

(iv) can decrease or increase

2. (a) What are the important factors which govern the choice of a refrigerant ?

(b) The COP of a wet ideal vapour compression system of capacity 5 tons is given to be 3. Work supplied to the compressor is 20 KJ/kg. Find the mass flow rate of the refrigerant and the refrigerating effect. **2x7=14**

3. (a) Name the various types of compressors. Describe, in detail, ***any two*** compressors.

(b) Define the term condenser. Explain the functioning of air-cooled condensers. **2x7=14**

4. (a) Differentiate clearly between open and closed air refrigeration systems.

(b) A refrigerating system operates on the reversed Carnot cycle. The higher temperature of the refrigerant in the system is 35°C and the lower temperature is - 15° C. The capacity is to be 12 tonnes. Neglect all losses. Determine:

(i) Coefficient of performance

(ii) Heat rejected from the system per hr

(iii) Power required **4+10=14**

5. (a) Distinguish between specific humidity and relative humidity, with the help of psychrometric chart.

(b) State the factors which should be taken into consideration while selecting a system of air-conditioning. **2x7=14**

6. (a) What are the various factors which are contributing to food spoilage ? List the causes of food spoilage.

(b) Discuss the concept of food freezing, storage conditions and distribution. **2x7=14**