B.Tech Even Semester Examination, May, 2025

Agricultural Engineering

(6th Semester)

Course No: AE-B02

(Refrigeration and Air Conditioning)

Full Marks: 50

Pass Marks: 25

Time: 2 hours

Note:

1. Attempt any five questions .
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

1. (a) What do you mean by the refrigerating effect? 3

   (b) Explain ozone depletion and its effect on global warming. 7

2. (a) Explain vapour compression refrigeration cycle with the help of a neat diagram. 7

   (b) Write a short note onthe application of refrigeration systems in food processing. 3

3. (a) Explain the role of the generator in a vapour absorption refrigeration system. 5

   (b) A Carnot cycle machine operates between the temperature limits of 60°Cand –10°C. Determine C.O.P. in both conditions when it works as heat pump and a refrigeration machine. 5

4. (a) What is the role of the compressor in vapour refrigerating system? Explain its classification. (1+4)

   (b) Explain the forced and natural convection condenser. 5

5. (a) Explain the following important psychrometry properties (i) Wet bulb temperature (ii) Relative humidity (iii) Dew point (iv) Saturated humidity (v) Humid volume 5

   (b) Draw the diagram ofthe psychometry chart for the air-water systemand discussthe importance of this chart. 5

6. (a) Explain how we can calculate thermal load for any refrigeration system. 5

   (b) Explain the working of cooling tower. 5

7. (a) Explain automatic expansion valve. 5

   (b) Explain in detail cooling and dehumidifying coils. 5

8. (a) Draw the P-V and T-S diagrams for the refrigerant during the refrigeration cycle and discuss the different processes involved. 7

   (b) Explain one ton of refrigeration. 3

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