



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2020 Admission
IV Semester Final Examination-August 2022

Pafe.2222

Food Refrigeration and Cold Chain (2+1)

Marks: 50
Time: 2 hours

I Fill in the blanks (10x1=10)

1. Second law of thermodynamics defines -----
2. HCFC stands for -----.
3. If the vapor is superheated at the end of compression, the operation is called -----.

Answer the following

4. Draw the skeleton description of the pressure–enthalpy chart.
5. Enumerate the types of condensers available for Refrigeration system.
6. Enlist the different types of chillers.

Define the following

7. Specific heat
8. One Ton of Refrigeration
9. Humidifier
10. Convection

II Write short notes on ANY FIVE of the following (5x2=10)

1. Elaborate on expansion valves used in Refrigeration system.
2. Write a note on refrigerants.
3. The performance test of an A/C unit rated as 40 TR seems to be poor cooling. The test on heat rejection to atmosphere in its condenser shows the following.
Cooling water flow rate: 4 L/s
Water temperatures : in 30°C out 40°C
Power input to motor : 48KW (95% efficiency)
Calculate the actual refrigeration capacity.
4. Write about reverse Carnot cycle and its limitations.
5. State merits and demerits of an air refrigeration system.
6. Enumerate the causes for Ozone depletion w.r.t refrigerant.
7. Briefly state the specific considerations of cold storage.

III Answer ANY FIVE of the following (5x4=20)

1. Illustrate with a neat sketch construction and working of a reciprocating compressor used in the Refrigeration system.
2. Examine the functions of primary and secondary refrigerants.
3. Describe in detail about various types of condensers available in Refrigeration systems.
4. Demonstrate the construction of doors and other openings in cold storage unit with neat sketch.
5. Write a note of insulation and properties of insulating materials in cold storage systems.
6. One ton of mango fruits at 35°C is to be cooled to 4°C in 8 hours. The radiation and other losses are estimated to be 10 percent of the refrigeration load. Find the tonnage of refrigeration and horsepower of the motor to be used if the efficiency of the motor is 85 percent. For want of data lets assume the specific heat of mango is equal to that of water.
7. Briefly explain Window air conditioning system and split air conditioning system.

IV

Write an essay on ANY ONE of the following

(1x10=10)

1. Illustrate the working of vapor compression cycle with a neat diagram.
2. Explain in detail about factors affecting COP of Refrigeration system.
