



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2022 Admission
IV Semester Final Examination – July 2024

Pafe.2222

Food Refrigeration and Cold Chain (2+1)

Marks: 50
Time: 2 hours

I Fill in the blanks

(10x1=10)

1. Carnot COP depends on the _____ only. It does not depend on the _____.
 2. One tonne of refrigeration equal to _____ kJ/min.
 3. In Vapour refrigeration system, heat rejection factor is the ratio of _____.
 4. Domestic refrigerator working on vapour compression cycle uses _____ type of expansion device.
 5. The refrigerant after condensation process is cooled below the saturation temperature before throttling. Such a process is called _____.
 6. For unsaturated air, the dew point temperature is _____ wet bulb temperature.
 7. The ratio of sensible heat to total heat is known as _____.
 8. The refrigerant R-717 is _____.
- Choose the correct answer
9. The superheating in a refrigeration cycle _____
(A) Does not alter C.O.P.
(B) Increases C.O.P.
(C) Decreases C.O.P.
(D) None of these
 10. The material of pipe lines for a system using Freon as a refrigerant should be _____
(A) Brass
(B) Copper
(C) Steel
(D) Aluminum

II Write short notes on ANY FIVE of the following

(5x2=10)

1. Explain the term "Coefficient of performance".
2. A domestic refrigerator which produces refrigeration at 25°C and heat be rejected to the ambient at 60°C.what is the maximum possible COP of the refrigerator?
3. What are the commonly used secondary refrigerant?
4. Why Capillary tube is not used in large capacity refrigeration system?
5. What are the major causes of food spoilage?
6. Factors affecting comfort air conditioning.
7. What are the methods used to maintain a proper indoor air quality?

III Answer ANY FIVE of the following

(5x4=20)

1. Explain the principle of air Refrigeration system.
2. What is the use of multistage compression in a refrigeration system? And Mention its Advantages?
3. Why is a reversed Carnot cycle not suitable for a refrigeration system?
4. What are the 4 main components in a vapour absorption refrigeration system and its function?
5. What do you understand by short-term and long-term cold storage?
6. Explain the following factor with the help of Psychrometry Process.
(a) sensible heating and sensible cooling process
(b) Heating and humidification, Cooling and dehumidification

7. One kg of air at 40 dry bulb temperature and 50% relative humidity is mixed with 2kg of air at 20 dry bulb temperature and 20 dew point temperature, calculate temperature and specific humidity of the mixture.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. R22 is compressed in a reciprocating compressor from saturation pressure at -15°C to saturation pressure at 45°C . The compressor has four cylinders, each with a bore of 10.0 cm and a stroke of 11.5 cm, clearance volume ratio is 0.04 and it runs at 750 rpm. Find
- (i) the clearance volumetric efficiency assuming isentropic compression,
 - (ii) the swept volume flow rate,
 - (iii) the mass flow rate and
 - (iv) the refrigeration capacity.
2. Explain the different types of Air conditioning System.
