

KERALA AGRICULTURAL UNIVERSITY
B.Tech (Food. Engg) 2011 Admission
IIIrd Semester Final Examination- January/February -2013

Cat. No: Fden.2103

Marks: 80

Title: Refrigeration and Cold Storage (1+1)

Time: 3 hours

Part -I

Answer the following

(10×1.0= 10.0)

Fill up the blanks

1. One ton of refrigeration is equal to _____ kJ/min.
2. The refrigerant used in domestic refrigerator is _____
3. The COP is the ratio of _____ to work done
4. The difference between dry bulb and wet bulb temperature is known as _____.
5. During vapour compression refrigeration cycle, heat is rejected in _____.
6. In vapour compression system lowest temperature occurs in _____
7. During sensible cooling of air the specific humidity remains _____
8. For unsaturated air the dew point temperature is _____ than the wet bulb
9. In airplane, air conditioning is based on _____ cycle
10. A domestic refrigerator capacity may be approximately _____.

Part II

(10×3=30.0)

Answer any TEN of the following

Write short notes on

1. Tons of refrigeration
2. Carnot cycle
3. Centrifugal compressor
4. Thermostatic expansion valve
5. CFC refrigerants
6. Humidifiers
7. Bypass factor
8. Relative humidity
9. Dew point temperature
10. Enthalpy
11. Cooling load
12. Sensible heating

Part III

(6 × 5.0 =30.0)

Answer any Six questions

1. Write a note on P-h and T-s diagram.
2. Explain evaporative condenser
3. What are the functions of refrigerants?
4. Explain working of an evaporative cooler.
5. Write a note on summer air conditioning.
6. What are the application of refrigeration and air conditioning?
7. Discuss in detail about different types of condenser.
8. Explain the working of vapour absorption system with a neat sketch.

Part-IV

(1 × 10.0 =10.0)

Answer any one question

1. The temperature limits of an ammonia refrigerating system are 25°C and -10°C. If the gas is dry at the end of compression, calculate the coefficient of performance of the cycle assuming no under cooling of the liquid ammonia. Use the following table for properties of ammonia. Also find capacity of unit if the mass flow rate is 6 kg/min.

Temperature (°C)	Liquid heat (kJ/kg)	Latent heat (kJ/kg)	Liquid entropy (kJ/kg K)
25	298.9	1166.94	1.1242
-10	135.37	1297.68	0.5443

2. Determine the final dry bulb temperature and relative humidity of air washed with re-circulated spray water if the air is initially at dry bulb temperature 35°C and 50% relative humidity as it enters an air washer which has a humidifying efficiency of 85%.
