KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food. Engg) 2012 Admission
III rd Semester Final Examination- December /January -2013

Cat. No: Fden.2103

Title: Refrigeration and Cold Storage (1+1)

Marks: 80
Time: 3 hours

1. For isentropic process the value of n is --------
2. Reverse carnot cycle has two isentropic and two -------- processes
3. Electrolux refrigeration is also known as ---------
4. COP is the ratio of -------- to work done
5. One ton of refrigeration is equal to ----------- kj/min
6. The refrigerant used in domestic refrigerator is ----------

True or false   1x4 = 4

7. Use of radio waves depletes ozone
8. one ton of refrigeration is equal to 3.5 kj/ min
9..Reverse joule cycle is called as Brayton cycle
10. Sub-cooling in refrigeration do not alter COP

Part II. Write short notes on any ten of the following   3x10 = 30

1. Nomenclature of refrigerant
2. Azeotropic refrigerant
3. Duct classification
4. Humidification and dehumidification
5. T-S diagram and p-h chart
6. Heat load in cold store
7. Steamjet refrigeration
8. Expansion devices
9. Ozone depletion
10. Evaporative cooling
11. Psychrometry
12. Heat pump

Part III. Answer six questions   5x6 = 30

1. Derive an expression for COP of Bell-coleman cycle of refrigeration
2. Explain the working of a electrolux refrigeration system with suitable sketch
3. Explain the various types of compressors and condensers used in refrigeration
4. The capacity of a refrigeration systems is 200 tons working between – 6°c and 25°c .Determine the mass of ice produced from water at 25°c. Find the work done per min. Assume the cycle operates on reverse carnot cycle and latent heat of ice is 335 kj/kg.

5. A vapour compression refrigeration uses methyl chloride and operates between – 10°c and 45°c. At the entry the refrigerant is dry saturated and after comp it attains 60°c. Find COP. The properties of refrigerants is given below.

Temp	Enthalpy		Entropy	
	Liq	vap	Liq	vap
– 10°c	45.4	460.7	0.183	1.637
45°c	133	483.6	0.485	1.587

6. Explain summer and winter air conditioning system
7. Explain vapour absorption refrigeration system
8. Write a note on properties of ideal refrigerant

Part IV. Answer any one of the following   (10 x 1=10)

1. Design a cold store for 10 tonnes of apple. Make reasonable assumptions.
2. Explain the working of a simple vapour compression refrigeration system.