

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fifth Semester**Agricultural Engineering***AI3001 – Refrigeration and Cold Storage****(Refrigeration Table and Psychrometric Chart Can be Permitted)***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	What is meant by ton of refrigeration?	L1	1	2
2.	Extend the function of a condenser in a refrigeration system.	L2	1	2
3.	Name the various components used in simple vapour absorption system.	L1	2	2
4.	Infer the refrigerant, absorbent, and auxiliary gas used in Electrolux refrigerator.	L2	2	2
5.	What is dew point temperature?	L1	3	2
6.	Write the various sources of heat gain of an air-conditioned space.	L1	3	2
7.	Differentiate summer from winter air conditioning.	L2	4	2
8.	How does humidity affect the human comfort?	L1	4	2
9.	Mention two vegetables that require low-temperature cold storage.	L2	5	2
10.	Why is transparent glass used in refrigerated display units?	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Explain the functions of an expansion device in a refrigeration system with neat sketch.	L2	1	16
	Or			
	b Classify different types of compressors used in refrigeration and discuss their applications.	L2	1	16
12.	a i Discuss the merits and demerits of a vapour absorption system over a vapour compression system.	L2	2	8
	ii Compile the function of absorber, generator, and analyzer in a vapour absorption system.	L2	2	8
	Or			
	b Elaborate the working of vapour compression refrigeration system with neat sketch.	L2	2	16

13.	a	Saturated air at 2°C is required to be supplied to a room where the temperature must be held at 20°C with a relative humidity of 50%. The air is heated and then water at 10°C is sprayed to give the required humidity. Identify the temperature to which the air must be heated and the mass of spray water required per m ³ of air room conditions. Assume that the total pressure is constant at 1.013 bar and neglect fan power.	L3	3	16
		Or			
	b	Illustrate in detail the effect of coil efficiency and by-pass factor on ADP.	L3	3	16
14.	a i	Outline the requirement of a winter air-conditioning system. Draw a schematic of the same.	L2	4	8
	ii	Explain in detail about Year round air conditioning system.	L2	4	8
		Or			
	b i	Explain the construction and working of summer air-conditioning system.	L2	4	8
	ii	State the advantages and disadvantages of unitary air conditioning systems.	L2	4	8
15.	a	A cold storage plant is required to store 20 tons of fish. The fish is supplied at a temperature of 30°C. The specific heat of fish above freezing point is 2.93 kJ/kgK. The specific heat of fish below freezing point is 1.26 kJ/kgK. The fish is stored in cold storage which is maintained at -8°C. The freezing point of fish is -4°C. The latent heat fish is 235 kJ/kg. If the plant requires 75 kW to drive it, Calculate i) The capacity of the plant, and ii) Time taken to achieve cooling. Assume actual C.O.P. of the plant as 0.3 of the Carnot C.O.P.	L4	5	16
		Or			
	b i	Analyze the various design considerations of a fruit cold storage facilities.	L4	5	8
	ii	Discuss the importance of insulation materials in cold storage systems.	L4	5	8