



End Semester Examination – Nov/Dec – 2016

Code :	14FP2011	Semester :	2016-17 ODD
Sub. Name :	Refrigeration, Air conditioning and Cold Storage	Duration :	3hrs
		Max. marks :	100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	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% 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 let us assume the specific heat of mango is equal to that of water.	CO3	10
	b.	100 kg of ice at -5 °C is placed in a bunker to cool some vegetables. 24 hours later ice has melted into water at 10°C. What is the average rate of cooling in KJ/h and Ton of refrigeration provided by ice	CO3	10
(OR)				
2.	a.	Illustrate with a neat sketch the working of vapor absorption cycle	CO2	8
	b.	Describe in detail about environmental issue caused by usage of refrigerant	CO1	7
	c.	Write a note on Pressure Enthalpy diagram	CO1	5
3.	a.	Explain in detail about freezing time of food materials with suitable diagram	CO2	8
	b.	Illustrate with a neat sketch the working of cryogenic freezers	CO2	7
	c.	Write a note on IQF	CO1	5
(OR)				
4.	a.	A spherical food product is being frozen in an air-blast freezer. The initial product temperature is 10°C and the cold air - 40°C. The product has a 7cm diameter with density of 1000 kg/m ³ , the initial freezing temperature is -1.25°C, the thermal conductivity of the frozen product is 1.2 W/(m K), and the latent heat of fusion is 250 kJ/kg. Compute the freezing time using plank's method. Convective heat-transfer coefficient h= 50 W/(m ² K)	CO3	12
	b.	Explain in detail about food quality in frozen storage	CO1	8
5.	a.	Describe in detail about packaging of chilled foods.	CO1	10
	b.	Explain in detail about construction and working of Blast chiller and Hydro cooler and vacuum cooler.	CO2	10
(OR)				
6.	a.	Explain in detail about control of storage conditions and temperature monitoring in chilled food storage	CO1	10
	b.	Describe in detail about packaging of chilled foods.	CO2	10
7.	a.	Write briefly about expanded and extruded polystyrene materials in cold storage.	CO2	10
	b.	Explain in detail with a sketches of Doors used in cold storage	CO2	10
(OR)				
8.	a.	Describe in detail about polyurethane phenolic foam applications in cold storage systems.	CO2	10
	b.	Explain in detail the types of cold storage	CO2	10
<u>Compulsory:</u>				
9.	a.	Describe in detail about field chilling methods and their applications	CO3	10

	b.	Explain about the RFID technologies used in cold chain	CO3	10
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