Total number of printed pages: 02 **Programme (PG) / 2nd Semester / PFET201**

2023

Emerging Food Processing Technologies-I: Beverages and Dairy

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **ANY FIVE** questions.*

1.	a)	Explain different ways membrane fouling can occur using schematic diagrams.	6
	b)	What are the main locations of enzymes in milk? How does chymosin catalyze milk coagulation during cheese manufacturing – Explain with a schematic diagram. Name a genetically engineered microorganism used for chymosin production.	2+6+1
	c)	List two major differences between squash and cordial. What are three major types of tea?	2+3
2.	a)	Describe a screw-press continuous fruit juice extractor using an appropriately labeled schematic diagram.	6
	b)	Draw a schematic diagram of a spray drying unit, label it appropriately, and elaborate how it works.	6
	c)	Briefly elaborate on the importance of pectinases and cellulases in enzymatic clarification of fruit juice. Name a type of wine, for which clarification of must is essential.	7+1
3.	a)	Elaborate on withering, maceration and fermentation of tea leaves. Explain significance of each of these three steps in processing of black tea.	12
	b)	Write short note on – (i) SO_2 in wine, and (ii) hops in beer.	4+4
4.	a)	How does pulsed electric field (PEF) work against microorganisms? Describe PEF pasteurization of beer using an appropriately labelled schematic diagram of the processing unit.	5+8
	b)	What is "premiumization" of a beverage? What is "de-creaming" in instant tea processing?	2+2
	c)	Reverse osmosis is a non-thermal membrane processing technology used to concentrate fruit juice. Explain.	3
5.	a)	How do (i) modification in membrane processing conditions, and (ii) modification in membrane surface help reduce membrane fouling?	5+5
	b)	List four major effects of γ-irradiation of fruit juice on quality of the beverage. Differentiate between ale and lager beer.	4+4
	c)	What is the major difference between milk coagulation in cheese and that in yogurt manufacturing?	2

6.	a)	What is homogenization of milk? List four major advantages of membrane processing compared to traditional thermal processing of fruit juice concentrate. State two major advantages of concentration of fruit juice or milk	2+2+2
	b)	Elaborate on processing flow-diagram of squash. What is the symbol mandated on the label of an irradiated food?	7+1
	c)	Explain the principle of ion-exchange process to concentrate a target component e.g., whey protein – Use an appropriately labelled schematic diagram to enrich your explanation.	6