

2024

**Food Process Equipment design***Full Marks: 100*

Time: Three hours

*The figures in the margin indicate full marks for the questions.**Answer any five questions.*

1.	a)	Write about the properties of stainless-steel and aluminum	6+4
	b)	Briefly detail the process of Fabrication and Installation of Equipment in food industries.	10
2.	a)	Give details about the operational characteristics (any five) that must be considered in the selection of food processing equipment	10
	b)	Write short notes on the following types of shell and tube heat exchangers. (i). Fixed tube sheet exchanger (ii). Internal floating head exchanger	5+5
3.	a)	Give the schematic diagram of any one of the shell and tube heat exchangers.	5
	b)	How minimum thickness of tube sheet is determined in shell and tube heat exchangers? Explain it.	10
	c)	Give details on the design aspects of baffles and tie rods in shell and tube heat exchangers.	5
4.	a)	Explain the working mechanism of plate type heat exchangers (PHE) with proper diagram. Mention the advantages, and disadvantages of PHE also.	10
	b)	Give short notes on the working mechanism of pneumatic conveyors with suitable diagram.	10
5.	a)	Explain the working mechanism of segmented belt conveyors with suitable diagram.	10
	b)	Describe the working principle of vibratory conveyors with proper diagram.	10
6	a)	Explain the working mechanism of multiple effect evaporators with suitable diagram.	10
	b)	Write about the different types of feeding arrangements in evaporators with suitable diagrams	10

7.	a)	Write the applications of evaporators in food processing.	5
	b)	Define the term - Crystallization and write the classification of crystals based on crystal angles.	2+3
	c)	Briefly describe the working principle of any one of crystallizers with proper diagram.	10