Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160412 Date:03/06/2022

Subject Name:Chemical Engineering Fundamentals III

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	What is an azeotrope?	**03**
	(b)	Explain Fick's law.	**04**
	(c)	What is importance of process control?	**07**
Q.2	**(a)**	What is reflux ratio?	**03**
	(b)	Write in brief on Extractive distillation?	**04**
	(c)	Discuss in detail about Steam Distillation with example and compare it with vacuum distillation?	**07**
		OR	
Q.2	**(c)**	What do you understand by quantity 'q'? Discuss location of 'q' line for typical feed condition in brief?	**07**
Q.3	**(a)**	What is crystallization?	**03**
	(b)	Define: (i)Selectivity(ii) Nucleation	**04**
	(c)	Explain with the sketch, the principle and working of tray drier.	**07**
		OR	
Q.3	**(a)**	What is drying operation?	**03**
	(b)	Explain rate of drying curve.	**04**
	(c)	Explain construction and working Swenson-Walker Crystallizer with the help of neat sketch.	**07**
Q.4	**(a)**	What is dry bulb temperature?	**03**
	(b)	Define: (1)Absolute humidity (2)Relative humidity	**04**
	(c)	Derive the equation for the rate of adsorption in a fixed bed and explain the concept of degree of saturation	**07**
		OR	
Q.4	**(a)**	Write Freundlich equation.	**03**
	(b)	Explain with suitable examples the difference in physical adsorption and chemisorption.	**04**
	(c)	Derive the equation of adiabatic saturation curve.	**07**
Q.5	**(a)**	Define first order system.	**03**
	(b)	Derive the Laplace Transforms of a step function of magnitude M.	**04**
	(c)	Explain the construction and working of Bourdon gauge also write its applications.	**07**

OR

Q.5	**(a)**	Define accuracy and static error.	**03**
	(b)	Explain the working of a bimetallic thermometer	**04**
	(c)	Derive the transfer function of a mercury in glass thermometer.	**07**

****