Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2141306 **Date: 30/05/2017**

Subject Name: Elements of Chemical Engg

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.**

			MARKS
Q.1		**Define the following**	**14**
	1	Reaction rate	**1**
	2	Rate constant	**1**
	3	Space velocity	**1**
	4	Space time	**1**
	5	Batch reactor	**1**
	6	PFR	**1**
	7	CSTR	**1**
	8	Single reaction	**1**
	9	Multiple reaction	**1**
	10	Thermodynamics	**1**
	11	Molecularity	**1**
	12	Order of reaction	**1**
	13	Activation Energy	**1**
	14	Collision	
Q.2	**(a)**	Differentiate between elementary and non-elementary reaction.	**03**
	(b)	Differentiate Single and multiple reactions.	**04**
	(c)	On the basis of thermodynamics and chemical kinetics, give classification of reaction.	**07**
		OR	
	(c)	Write a short note on Fixed bed reactor.	**07**
Q.3	**(a)**	Enlist applications of fluidized bed reactor with a brief note.	**03**
	(b)	Write the short note on performance equation for CSTR.	**04**
	(c)	Derive the performance equation for PFR.	**07**
		OR	
Q.3	**(a)**	Short note. Batch Reactor	**03**
	(b)	Explain experimental methods for F – curve	**04**
	(c)	Explain the procedure to convert E curve to F curve obtained from Impulse Input.	**07**
Q.4	**(a)**	Explain the working of PFR.	**03**
	(b)	Explain experimental methods for C – Curve.	**04**
	(c)	Explain the procedure to convert F curve to E curve obtained from Step Input.	**07**
		OR	
Q.4	**(a)**	Enlist & explain the ways to transfer heat.	**03**
	(b)	Describe any two variables affecting rate of reaction.	**04**
	(c)	Temperature dependency from Arrhenius's law. Explain	**07**

Q.5	**(a)**	Enlist the characteristics of tracer.	**03**
	(b)	Write a short note on RTD.	**04**
	(c)	Discuss temperature dependency from thermodymics.	**07**

OR

Q.5	**(a)**	How to calculate activation energy?	**03**
	(b)	Explain the second order reaction with example.	**04**
	(c)	Give explanation on temperature dependency from collision theory.	**07**

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