Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2141306 Date:09/05/2019

Subject Name: Elements of Chemical Engg

Time:02:30 PM TO 05:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Differentiate between elementary and non-elementary reaction.	**03**
	(b)	Enlist the factors affecting the rate of reaction with example.	**04**
	(c)	Give classification of reactions on the basis of thermodynamics and chemical kinetics.	**07**
Q.2	**(a)**	Write a brief note on parallel reaction.	**03**
	(b)	Define Space-Time and Space-Velocity for flow reactors.	**04**
	(c)	Write a short note on Fixed bed reactor.	**07**
		OR	
	(c)	Write a short note on PFR.	**07**
Q.3	**(a)**	Differentiate between performance equations for constant volume batch reactor and varying volume batch reactor.	**03**
	(b)	Discuss advantages and disadvantages of fluidized bed reactor.	**04**
	(c)	Derive the mass balance equation for CSTR.	**07**
		OR	
Q.3	**(a)**	Differentiate between order of reaction and molecularity of reaction.	**03**
	(b)	Write a brief note on chemical kinetics.	**04**
	(c)	Derive the mass balance equation for Batch reactor.	**07**
Q.4	**(a)**	Explain experimental methods for F – curve.	**03**
	(b)	Milk is pressurized if it is heated to 65^{o}C for 30 min but if it is heated to 72^{o} C, it only needs 15 s for the same result. Find the activation energy of this sterilization process.	**04**
	(c)	Explain temperature dependency from Arrhenius's law.	**07**
		OR	
Q.4	**(a)**	Explain experimental methods for C – Curve.	**03**
	(b)	At 27^{o}C, a reaction has a rate constant of $0.010s^{-1.}$ At What temp, would the reaction be twice as fast? E= 50 KJ/mol. (Assume , Concentration of reactant and E is unchanged.)	**04**
	(c)	Explain half life approach for estimating reaction order.	**07**
Q.5	**(a)**	Differentiate between Ideal flow reactor and Non- Ideal flow reactor.	**03**
	(b)	Write a short note on RTD.	**04**
	(c)	Give explanation on temperature dependency from collision theory.	**07**
		OR	
Q.5	**(a)**	Give the Application of Thermodynamics 's law.	**03**
	(b)	Enlist & explain the ways to transfer heat.	**04**
	(c)	Write a short note on measurement of RTD.	**07**

****