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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 162304 **Date: 03/05/2017**

Subject Name: Reaction Engineering & Rheology

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.**

Q.1	**(a)**	Define Chemical Kinetics. With suitable examples , classify Chemical Reactions.	**07**
	(b)	1. The pyrolysis of Ethane proceeds with an activation energy of about 75000 Cal. How much faster is the decomposition at 700 deg.C than at 550 deg.C? 2.Differentiate order v/s. molecularity	**07**
Q.2	**(a)**	At 500 K the rate of a bimolecular reaction is ten times the rate at 400 K. Find the activation energy for this reaction (a) from Arrhenius Law (b)from Collision theory.	**07**
	(b)	Discuss Maxwell model	**07**
		OR	
	(b)	Discuss Arrhenius Law . What is the significance of Activation energy.	**07**
Q.3	**(a)**	Explain kinetics of free radical chain polymerisation	**07**
	(b)	Discuss kinetics of Anionic polymerization	**07**
		OR	
Q.3	**(a)**	Discuss rate of chemical reaction.Also discuss factors affecting rate of reaction	**07**
	(b)	Differentiate between Elementary and Non Elementary reactions	**07**
Q.4	**(a)**	Explain die swell and melt fracture effect in polymer melt flow	**07**
	(b)	Discuss in detail about Non Newtonian fluids. Give suitable examples.	**07**
		OR	
Q.4	**(a)**	Discuss Capillary rheometer	**07**
	(b)	[a]On doubling the concentration of reactant, the rate of reaction triples. Find out the reaction order. [b] Define : Rheology, shear thickening, Apparent Viscosity,homogenous reactions	**07**
Q.5	**(a)**	Discuss Boltzmann Principle	**07**
	(b)	What is Power Law? Discuss in detail.	**07**
		OR	
Q.5	**(a)**	1. The activation energy of a chemical reaction is 17982 cal/mol in the absence of a catalyst and 11980 cal/mol with a catalyst. By how many times will the rate of the reaction will grow in the presence of a catalyst, if a reaction proceeds at 25 deg.C? 2. Discuss WLF equation	**07**
	(b)	What is Weissenberg effect? Discuss in detail.	**07**

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