

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3162313****Date:05-12-2023****Subject Name: Kinetics and Rheology of Plastics****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define the terms: rate of reaction, Molecularity and Order of reaction.	03
	(b) Write difference between Elementary and Non Elementary reactions.	04
	(c) Discuss about different type of chemical reactors and their properties.	07
Q.2	(a) Define Reactivity ratio.	03
	(b) Explain Extent of reaction and degree of polymerization.	04
	(c) At 500 K the rate of bimolecular reaction is ten times then the rate at 400 K. Find the activation energy for this reaction by using Arrhenius equation	07
	OR	
	(c) Define the Activation Energy and derive the Arrhenius law.	07
Q.3	(a) Give the Definition & importance of Rheology.	03
	(b) What is melt fracture effect in polymer melt flow.	04
	(c) Explain the kinetics of cationic and anionic polymerization.	07
	OR	
Q.3	(a) Discuss about creep curve of typical plastics	03
	(b) Describe zero shear viscosity.	04
	(c) Explain about the Pseudo plastic fluids, Dilatants fluids, and Bingham plastic fluid with suitable graph.	07
Q.4	(a) Give the difference between Burger model and Zener model.	03
	(b) Write short notes on Hook's model and Newton's model.	04
	(c) Explain Maxwell Model for viscoelasticity of plastics.	07
	OR	
Q.4	(a) Write about the Weissenberg effect.	03
	(b) Write the Boltzmann principle..	04
	(c) Describe the WLF equation in detail.	07
Q.5	(a) Give that Parameters Influence the Viscosity.	03
	(b) Write short notes on Die Swell, and Melt fracture.	04
	(c) Describe the Cone and plate viscometer with suitable diagram.	07
	OR	
Q.5	(a) Write short notes on Capillary force.	03
	(b) Explain Sharkskin defects	04
	(c) Describe the Concentric cylinder Rheometer	07
