GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014

$\mathbf{DE} \cdot \mathbf{SEWIESTER} - \mathbf{v} \mathbf{I} \cdot \mathbf{EXAWIINATION} - \mathbf{SUWIWIER} \cdot 2014$			
Subject Code: 162304 Date: 28-05-2014			
Subject Name: Reaction Engineering and Rheology			
Time	Time: 10:30 am - 01:00 pm Total Marks: 70		
Instru	1. 2. 3.	s: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	Describe batch and semi-batch reactor along with advantages and disadvantages. What are elementary and non-elementary reactions? Give difference between them.	07 07
Q.2	(a)	What are Non-Newtonian fluids? Explain types of Non-Newtonian fluids with suitable examples.	07
	(b)	What is chemical kinetics? Give detail classification of chemical reactions with suitable examples.	07
		OR	
	(b)	Explain kinetics of free radical chain polymerization.	07
Q.3	(a)	 Answers the following- (i) Explain creep and relaxation of typical plastics. (ii) The rate constants of a certain reaction are 1.6 x 10⁻³ and 1.625 x 10⁻² (s) ⁻¹ at 10 	04 03
	(b)	What is tank reactor? Explain continuous stirred tank reactor (CSTR).	07
0.3	(a)	Explain Melt flow index with neat sketch	07
Q .0	(b)	Answers the following-	07
		(i) At 1100 K n-nonane thermally cracks 20 times as rapidly as at 1000 K. Estimate the activation energy for the decomposition.	03
		(ii) Explain Maxwell model for viscoelasticity.	04
Q.4	(a) (b)	Explain kinetics of cationic polymerization. Answer the following:	07
		 (i) The rate constant of a reaction at 27 ° C is 1.3 x 10⁻³ (s) ⁻¹. Determine the frequency factor. Take E (energy of activation) = 128170 cal/mol. (ii) Write a note on Fluidized-Bed reactor. 	03
			04
		OR	
Q.4	(a)	Explain Boltzman superposition principle.	07
	(b)	Explain Mooney viscometer with applications.	07
Q.5	(a) (b)	Explain die swell and melt fracture effect in polymer melt flow. Write a note on: The Power law.	07 07
o -		OR	07
Q.5	(a) (b)	Discuss Weissenberg Effects. Explain Optical Birefringence method.	07 07
