

**GUJARAT TECHNOLOGICAL UNIVERSITY****B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012****Subject code: 162304****Date: 05/01/2013****Subject Name: Reaction Engineering & Rheology****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Explain the order and molecularity of reaction with examples? Write the difference between the order of reaction and molecularity of reaction? **07**  
(b) Derive the equation for First order kinetics of chemical reaction? And Express its unit? **07**
- Q.2** (a) Write the mechanism and kinetics of anionic polymerization **07**  
(b) Explain on plug flow reactors in detail **07**
- OR**
- (b) State and explain the elementary and non-elementary reaction with examples? Write the difference between the elementary and non-elementary reaction? **07**
- Q.3** (a) Explain with neat sketch of any single ideal reactor **07**  
(b) Explain the Effect of rate of strain with respect to time on mechanical behavior of polymeric materials **07**
- OR**
- Q.3** (a) Express the WLF equation? **07**  
(b) State and Explain shear thinning and shear thickening of polymer melts. **07**
- Q.4** (a) Explain The Voigt Oelvin element for a viscoelastic material. **07**  
(b) Write on Weissenberg effect of polymer melt solution **07**
- OR**
- Q.4** (a) Explain the time dependant fluids, shear rate dependant fluids **07**  
(b) State and explain the power law equation **07**
- Q.5** (a) Explain the Measurements of Rheological properties by Moony Viscometer **07**  
(b) Write on analysis of rheological parameters of calendaring process **07**
- OR**
- Q.5** (a) State the following **07**  
i. Apparent viscosity  
ii. Activation energy and its significance  
iii. Continuous stirrer tank reactor (CSTR)  
(b) How to study measure melt flow index for polymeric materials, explain in detail? **07**

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