

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018****Subject Code:2152604****Date:16/11/2018****Subject Name:Rheology of Rubber****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.

		MARKS
Q.1	(a) Why Bingham Plastic Fluid is also Known as Viscoplastic Fluid?	03
	(b) Give the difference between Eyring Model and Eyring Powel Model.	04
	(c) List out the different three parameter models used for Rheological Equation. Explain any one in detail.	07
Q.2	(a) What is the difference between Laminar and Turbulent flow?	03
	(b) "Reynolds number is important parameter for Fluid flow" Justify the statement.	04
	(c) Derive the equation for Laminar Flow in Pipe.	07
	OR	
	(c) Derive the equation for velocity profile in Turbulent flow.	07
Q.3	(a) Write the importance of Momentum in Fluid flow.	03
	(b) Give the difference between the Thixotropic and Rheopectic fluid.	04
	(c) Derive the equation of Maximum velocity for flow through Circular Tube.	07
	OR	
Q.3	(a) Write the boundary conditions for shell momentum balance.	03
	(b) State the assumptions implied in the development of Hagen poiseuille law.	04
	(c) Derive the equation of Volumetric flow rate for flow through Falling film.	07
Q.4	(a) List out the different methods and viscosity ranges for various viscometers.	03
	(b) State the assumption used for falling sphere viscometer.	04
	(c) Derive the equation of Newtonian Fluid for Cup & Bob Viscometer.	07
	OR	
Q.4	(a) Write the disadvantages of Plunger Viscometer.	03
	(b) Give a brief note on Cone and Plate Viscometer.	04
	(c) Derive the equation of Bingham Plastic for Capillary Viscometer.	07
Q.5	(a) How molecular structure will affect the Rheology of rubber?	03
	(b) "Molecular weight affects the viscosity of Polymer" justify the statement.	04
	(c) Explain the effect of Temperature and Pressure on Rheology of Rubber.	07
	OR	
Q.5	(a) List out the variable influencing the Rheology of rubber.	03
	(b) Write a brief note on Shear induced crystallization.	04
	(c) Discuss in detail about " Molecular Motions"	07
