

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- V (New) EXAMINATION – WINTER 2019****Subject Code: 2152604****Date: 04/12/2019****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) “Reiner Philipp off model is used as three parameter model” justify the statement.	03
	(b) Draw the flow chart of Non Newtonian fluid and explain any one in detail.	04
	(c) Discuss the Ostwald De Waele model and derive its equation.	07
Q.2	(a) Define the Terms: (i) Reynolds number (ii) Laminar flow (iii) Turbulent flow.	03
	(b) “Reynolds number is important parameter for Fluid flow” Justify the statement.	04
	(c) Derive the equation for velocity profile for Newtonian fluid.	07
	OR	
	(c) Derive the equation for velocity profile in Non Newtonian fluid.	07
Q.3	(a) What do you mean by turbulence damping?	03
	(b) State the assumptions implied in the development of Hagen poiseuille law.	04
	(c) Derive the Velocity profile, Maximum velocity profile and Average velocity profile equations for flow through circular tube.	07
	OR	
Q.3	(a) Write the boundary conditions for shell momentum balance.	03
	(b) Derive the momentum flux distribution equation for falling film.	04
	(c) Draw the schematic diagram of Flow through annulus tube and derive the Average Velocity profile equations.	07
Q.4	(a) List out the different types of Viscometer used in rubber industries.	03
	(b) Draw the figure of Sandwich rheometer and explain it in brief.	04
	(c) Explain the different applications of Mooney viscometer in detail.	07
	OR	
Q.4	(a) Write the shear stress equation of Mooney Viscometer.	03
	(b) Which parameter we have to keep in mind in falling sphere viscometer?	04
	(c) Draw the diagram of Biconical rheometer and explain it in detail.	07
Q.5	(a) Write the procedure for sample preparation of moony viscosity test.	03
	(b) How molecular weight and molecular structure will affect the Rheology of rubber?	04
	(c) Explain the effect of temperature on the Rheology of rubbers.	07
	OR	
Q.5	(a) Write the equation for “Zero shear viscosity.”	03
	(b) What do you mean by entanglement of molecules? Explain it with suitable example.	04
	(c) Short note on “ Molecular Motions”	07
