

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023

Subject Code:3142607

Date:17-07-2023

Subject Name:Rubber Rheology

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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Define the term (i) Momentum (ii) Turbulence flow (iii) Elasticity	03
	(b) Give the classification of Fluid.	04
	(c) Discuss in detail about Eyring Powell fluid model.	07
Q.2	(a) Write the application and disadvantage of Oswald model.	03
	(b) Give the difference between Reiner-Philipoff and Meter model.	04
	(c) Discuss in detail about the Bingham model.	07
	OR	
	(c) Discuss in detail about the Power model.	07
Q.3	(a) Describe the Toms effect.	03
	(b) Mention the assumptions implied for the development of Hagen Poiseuille law.	04
	(c) Derive the equation of volumetric flow rate for Falling film.	07
	OR	
Q.3	(a) Define the term Reynolds number and write its equation.	03
	(b) Write the difference between Laminar flow and Turbulent flow.	04
	(c) Derive the equation of maximum velocity for flow through Annulus.	07
Q.4	(a) Write the importance of Mooney Viscometer.	03
	(b) Draw the schematic representation of Rheograph.	04
	(c) Discuss the effect of entanglement of molecules & molecular motions.	07
	OR	
Q.4	(a) What do you mean by Stress Tensor?	03
	(b) Write the effects of presence of the branching on the molecular structure.	04
	(c) Derive the Continuity Equation.	07
Q.5	(a) Give the difference between Short range motion and Long ranged motion.	03
	(b) Write a brief note on Biconical Rheometer.	04
	(c) List the types of Elongational Flow. Explain it in detail.	07
	OR	
Q.5	(a) What do you mean by Rheology? Write their significance.	03
	(b) Write a brief note on Cup and Bob Viscometer.	04
	(c) Short note on: “Shearing disk Rheometer”.	07
