

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III(NEW) EXAMINATION – SUMMER 2023****Subject Code:3132306****Date:24-07-2023****Subject Name:Applied mathematics in Plastic Industry****Time:02:30 PM TO 05:00 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 Stress, Young Modulus and Viscoelasticity.	03
	(b) Explain the Newton's law of viscosity.	04
	(c) Write short notes on (i) Isometric and Isochronous graphs. (ii) Pseudo-elastic design method for plastics.	07
Q.2	(a) Define the coefficient of thermal expansion.	03
	(b) Explain fracture behavior of Plastics.	04
	(c) Explain the Zener model with mathematical expression for Plastic materials.	07
	OR	
	(c) Explain the Kelvin-Voigt model with mathematical expression.	07
Q.3	(a) Explain polymer melt with example.	03
	(b) Explain Newton's model with stress-strain and elongation time plot.	04
	(c) Define deformation and explain it in detail in terms of Plastic material	07
	OR	
Q.3	(a) Define velocity gradient.	03
	(b) Write application and advantages of Ram Extruder.	04
	(c) Explain Burger model for Plastic.	07
Q.4	(a) Explain the fiber reinforcement.	03
	(b) Explain the swelling ratio.	04
	(c) Explain the analysis of heat transfer during polymer processing.	07
	OR	
Q.4	(a) Explain Creep compliance	03
	(b) Write short notes on stress concentration.	04
	(c) Discuss about Concentric Cylinder Viscometer with suitable diagram.	07
Q.5	(a) Write short notes on types of Matrix.	03
	(b) Discuss Residence Time and Relaxation Time.	04
	(c) Explain the Power law fluid along a channel of uniform circular cross-section.	07
	OR	
Q.5	(a) Write short notes on aspect Ratio.	03
	(b) Define Non Newtonian Fluids with two examples.	04
	(c) Discuss cone and plate Viscometer with suitable diagram in detail.	07

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