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GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:3153621 **Date:01/02/2021**

Subject Name:Glass Science & Technology

Time:10:30 AM TO 12:30 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Write the condition of Zachariason for mixed oxide glass formation.	**03**
	(b)	Explain Stanworthy's Classification of Network Former, Intermediate and Modifier	**04**
	(c)	Establish the Empirical Equation for Homogeneous Nucleation.	**07**
Q.2	**(a)**	Define Glass and how it is different from Crystal.	**03**
	(b)	Differentiate between Silicate theory and Kinetic theory of Glass formation.	**04**
	(c)	Explain glass formation with the Plot of Enthalpy vs. Temperature.	**07**
Q.3	**(a)**	Define and Explain Annealing of Glass.	**03**
	(b)	Explain the Refining action of glass by addition of fining agents.	**04**
	(c)	Explain the role of Network Former, Intermediate and Modifier in detail in Glass.	**07**
Q.4	**(a)**	Define Borosilicate Glass.	**03**
	(b)	Write short notes on Amber Glass.	**04**
	(c)	Refer to the given glass composition: $20Na_2O$-80 SiO_2 .Determine the quantity of raw materials that can be used to make the batch composition to achieve the above formulation in final glass.	**07**
Q.5	**(a)**	Describe Photo sensitive glass.	**03**
	(b)	Describe short note on Spinodal decomposition that happens during phase separation in glass.	**04**
	(c)	Explain Glass Refining Process in detail.	**07**
Q.6	**(a)**	Differentiate between Soda Lime Silica glass and Borosilicate glass.	**03**
	(b)	Discuss on Chalcogenide Glass.	**04**
	(c)	Describe the Thermal Toughening Process and Chemical Toughening Process of Glass.	**07**
Q.7	**(a)**	Write short notes on Soda Lime Silica glass.	**03**
	(b)	Differ between E- glass and S- glass.	**04**
	(c)	Explain on Working point, Softening point, Annealing point and Strain Point of glass.	**07**
Q.8	**(a)**	Define amorphous materials with examples.	**03**
	(b)	State the importance of random network model for explaining glass structure	**04**
	(c)	Explain the colouration process of photosensitive glass.	**07**

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