

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 3133603****Date: 5/12/2019****Subject Name: Introduction to Glass & Ceramics-I****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.

Q.1	(a)	Discuss short notes on silica gel.	03
	(b)	Discuss the difference between displacive and reconstructive transformation.	04
	(c)	Describe the polymorphic transformation of silica with flow diagram	07
Q.2	(a)	Explain the formation of silica network structure	03
	(b)	Describe the ring structure in silica materials and show how cordierite material is derived from Beryl structure.	04
	(c)	Describe in detail feldspar structure.	07
OR			
Q.3	(c)	Explain the occurrences of alumina.	07
	(a)	Why K ⁺ ion in muscovite is not exchangeable.	03
	(b)	Differ between muscovite and lepidolite	04
(c)	Describe the development of Kaolinite structure from talc	07	
OR			
Q.3	(a)	Write short note on flint materials.	03
	(b)	Describe the DTA analysis of talc with reference to the reactions occurring at endothermic and exothermic peaks.	04
	(c)	Describe the NaCl structure with reference to its radius ratio and unit cell.	07
Q.4	(a)	What is dead burnt magnesia?	03
	(b)	Define natural and sea water magnesia.	04
	(c)	Explain the synthesis of Sea water magnesia	07
OR			
Q.4	(a)	Define normal & inverse spinel.	03
	(b)	Describe chrome ore structure.	04
	(c)	Explain how sea water magnesia is synthesized.	07
Q.5	(a)	Define a flux material.	03
	(b)	Define what is flux factor in silica refractories and how it is measured.	04
	(c)	Explain the fundamental structure of chlorite group of materials.	07
OR			
Q.5	(a)	Discuss the polymorphic transformation of zirconia.	03
	(b)	Explain the difference between Fully stabilized and partially stabilized zirconia.	04
	(c)	Explain the mechanism of transformation toughening in zirconia.	07