

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016****Subject Code:2173614****Date:21/11/2016****Subject Name:Refractories-II(Department Elective - VIII)****Time:10.30 AM to 1.00 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	Short Questions	14
	1 Write the formula of cordierite	
	2 Write the chemical composition of borosilicate glass	
	3 Write the formula of cementite	
	4 Write the formula of bainite.	
	5 Write the formula of martensite.	
	6 Write the formula of lepidolite	
	7 Give an example of eutectoid reaction.	
	8 Write the formula of	
	9 Define toughening of glass	
	10 Define homogeneous nucleation.	
	11 Why mullite is called congruently developed compound?	
	12 Why andalucite is favoured over other aluminosilicates?	
	13 What is the shortcoming of kyanite?	
	14 Where silimanite is found more in nature?	
Q.2	(a) What is meant by refractoriness under load of a material? Explain	03
	(b) Discuss the polymorphic transformation of zirconia.	04
	(c) Explain transformation toughening of zirconia bodies.	07
	OR	
	(c) Explain silicate and Kinetic theory of glass formation	07
Q.3	(a) Define sintering.	03
	(b) Describe driving energy for sintering.	04
	(c) Explain different types of sintering.	07
	OR	
Q.3	(a) Explain Growth phenomena	03
	(b) Explain difference between nucleation and growth.	04
	(c) Explain the model of crystal growth with mathematical derivation	07
Q.4	(a) Define steel	03
	(b) Explain different types of steel.	04
	(c) Explain the phase diagram of Fe- Fe ₃ C	07
	OR	
Q.4	(a) Define normal and inverse spinel.	03
	(b) Describe the occurrences of chrome ore.	04
	(c) Describe the structure of chrome ore in detail.	07
Q.5	(a) Define different types of alumina.	03
	(b) Describe occurrences of alumina.	04
	(c) Describe synthesis of alumina by Bayer's process.	07
	OR	
Q.5	(a) What are raw materials normally used in glass making?	03

- (b) Explain the parameters for raw material selection. **04**
- (c) Explain the role of silica, soda ash and alumina in soda lime silica glass. **07**
