

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-III (New) EXAMINATION – WINTER 2015**

**Subject Code:2133603**

**Date:18/12/2015**

**Subject Name: Introduction to Glass & Ceramic Technology-I**

**Time: 2:30pm to 5:00pm**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**MARKS**

|            |   |                                     |
|------------|---|-------------------------------------|
| <b>Q.1</b> | <b>Short Questions</b>  | <b>14</b>                           |
|            | <ol style="list-style-type: none"><li>1 Write the density of quartz.</li><li>2 Write the density of trydimite.</li><li>3 Write the density of crystobalite.</li><li>4 Write formula of beryl.</li><li>5 Write the formula of orthoclase.</li><li>6 Write the formula of kaolinite clay.</li><li>7 Write the formula of talc.</li><li>8 Write the formula of pyrophyllite.</li><li>9 Write the formula of muscovite.</li><li>10 Write the formula of Biotite.</li><li>11 What is lepidolite?</li><li>12 What is paragonite?</li><li>13 What is margarite?</li><li>14 What is phlogopite?</li></ol> |                                     |
| <b>Q.2</b> | <ol style="list-style-type: none"><li>(a) Discuss the polymorphic transformation of silica.</li><li>(b) Differentiate between Conversion and Inversion reactions.</li><li>(c) Describe the structure of Chrome ore in detail.</li></ol>   | <b>03</b><br><b>04</b><br><b>07</b> |
|            | <b>OR</b>   |                                     |
|            | <ol style="list-style-type: none"><li>(c) Describe the chemical properties of Chrome ore in detail.</li></ol>   | <b>07</b>                           |
| <b>Q.3</b> | <ol style="list-style-type: none"><li>(a) What are aluminosilicates?</li><li>(b) Describe the structure and properties of various aluminosilicates in detail.</li><li>(c) Describe the transformation toughening behavior of zirconia bodies.</li></ol>   | <b>03</b><br><b>04</b><br><b>07</b> |
|            | <b>OR</b>   |                                     |
| <b>Q.3</b> | <ol style="list-style-type: none"><li>(a) Describe the Island structure, Group structure of silicates.</li><li>(b) Describe the Ring structure, Sheet structure found in silicate materials.</li><li>(c) Write various polymorphs of silica. Explain the formation of silica network.</li></ol>   | <b>03</b><br><b>04</b><br><b>07</b> |
| <b>Q.4</b> | <ol style="list-style-type: none"><li>(a) Describe the occurrence of alumina.</li></ol>   | <b>03</b>                           |

- (b) Discuss the structure of alumina in detail. **04**
- (c) Describe the Bayer's Method of synthesis of Alumina in detail. **07**

**OR**

- Q.4**
- (a) Write short notes on Silica gel and Vitreous Silica. **03**
  - (b) Write short notes on Wollastonite, Lepidolite. **04**
  - (c) Define a flux material. Describe the framework network of feldspar. **07**
- Q.5**
- (a) How can the hydration resistance of magnesite be improved? **03**
  - (b) What is natural magnesite and Why does it have low hydration resistance? **04**
  - (c) What is Sea Water Magnesia and how is it synthesized? **07**

**OR**

- Q.5**
- (a) Why does montmorillonite group of materials feel soapy? **03**
  - (b) Explain the formation of kaolinite structure. **04**
  - (c) Describe the formation and structure of Muscovite mica and Biotite mica. **07**

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