

**ANNEXURE I**  
**CERAMIC TECHNOLOGY**

- 1. GEOLOGY AND MINERALOGY OF CERAMIC RAW MATERIALS:** Definition of Geology, Petrology and Mineralogy, Ceramic minerals, Ceramic Clays and their classification, Physical properties of Clays, Grog and its properties, Types of Silica Minerals, Types of Alumina Minerals, Feldspar group Minerals, Carbonate minerals, Bone ash, Fly ash.
- 2. WHITE WARE & HEAVY CLAY WARE:** Machinery and equipment used in ceramic industry. Body preparation. Fabrication methods. Drying of Clay products. Setting and Firing of Clay products. Classification of Earthenware, Porcelain ware, Special Porcelain ware, Bone china, Sanitary ware, Heavy Clay ware, Floor and Wall Tiles. Glazes, Frits, Colors and decoration. Quality control.
- 3. REFRACTORIES:** Classification, properties and Fabrication techniques of Refractories. Insulating Refractories. Kiln furniture and accessories. Refractory Cements and mortars. Alumino silicate Refractories, Silica Refractories, Dolomite Refractories, Magnesite Refractories, Chrome-Magnesite Refractories, Mag-Chrome Refractories, Carbon Refractories, Chromite Refractories. Super Refractories properties and uses.
- 4. GLASS TECHNOLOGY:** Raw materials, Classification of glass making raw materials, Batch preparation, weighing, mixing, Conveying and Charging, Glass melting process, Types of furnaces, Types of fabrication techniques for Containers, Sheet glass, Float glass, optical glasses, safety glass, Tubes, Annealing, Tempering, Decoration, Testing and Quality Control of glass, Special glasses, Heat resistant glasses, Fiber glass, Glass ceramics.
- 5. CEMENT TECHNOLOGY:** Raw materials, lime stone and limes, Batch preparation, Mixing, Types of manufacturing process, Natural Cements, Portland Cements, Special Cements, Rotary kiln.
- 6. ADVANCED CERAMICS:** Purification of raw materials, shaping techniques, and firing techniques, Electrical Ceramics, Electronic Ceramics, Ceramic Composites, Magnetic Ceramics, Nuclear Ceramics and other Structural Ceramics. Stabilised Zirconia and products, Alumina products.
- 7. FUELS, FURNACES & PYROMETRY:** Construction and working of Industrial Pyrometers, furnaces used in glass industry, enamel industry, Kilns used in Ceramic industry, Types of fuels, Advantages and disadvantages of different physical state of Fuels, Combustion, Classification of fuels, NCES & RES, Hydrogen gas.
- 8. ENAMELS AND GLAZES:** Raw materials, Enamel Compositions, Batch preparation, Metal treatment of enamels, Application of enamel and firing of enamels, Defects and decoration, Batch compositions of glazes, Glaze preparation, Firing, Defects and testing of Lead glazes, Leadless glazes, Feldspathic & Calcareous glazes.

**ANNEXURE II**  
**Number of Questions to be set Unit wise (Total 100)**  
**CERAMIC TECHNOLOGY**

UNIT NO	TOPICS	MARKS
I	Geology and Mineralogy of ceramic raw materials	15
II	White ware & heavy clay ware	17
III	Refractories	17
IV	Glass technology	17
V	Cement technology	09
VI	Advanced ceramics	10
VII	Fuels, Furnaces & Pyrometry	05
VIII	Enamels and glazes	10
<b>Total</b>		<b>100</b>

**ANNEXURE III**  
**MODEL QUESTIONS FOR CERAMIC TECHNOLOGY**

1. Zinc oxide in Glass Improves the Property of
  - 1) Stabilizing
  - 2) Fluxing
  - 3) Opacifying
  - 4) Reafractoriness
  
2. Fluorepar is added in Enamels as
  - 1) Opacifier
  - 2) Coloring Agent
  - 3) Flux
  - 4) Floating Agent