RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FOURTH SEMESTER EXAMINATION, AUGUST 2021

SECOND YEAR (BATCH 2019-22)

Date : 09/08/2021 **INDUSTRIAL CHEMISTRY (Honours)**

Time : 11.00 am – 1.00 pm **Paper : IX [CC 9]** Full Marks : 50

Answer **any five** questions : [5 × 10]

1. a) Write the major ingredients for the manufacturing of traditional ceramics. [2]

   b) What is polymorphic transformation? [2]

   c) Write & explain the polymorphic transformation of Zirconia. [3]

   d) Why fused quartz has high thermal shock resistance? [3]

2. a) The density of Al_2O_3 is 3.96 g/cm^3. A ceramic part is produced by sintering alumina powder. It weights 80 g when dry, 92 g after it has soaked in water, and 58 g when suspended in water. Calculate the apparent porosity, the true porosity, and the closed porosity. [3]

   b) What are advantages of castable refractories? [2]

   c) Draw & explain the Alumina-Magnesia phase diagram? [3]

   d) What do you mean by LCC & ULCC? [2]

3. a) How are whiteware ceramics for domestic uses classified? [2]

   b) What are the differences between enamelling & glazing. [4]

   c) Explain the different steps involved in the manufacturing process of ceramic insulator. Mention its properties & uses. [4]

4. a) What is clay? Mention the chemical composition of clay? [3]

   b) What is sintering? Mention its importance. [3]

   c) Write a note on Traditional Ceramics Processing. [4]

5. a) Mention approximate body composition of triaxial hard porcelain stating the function of each ingredient. How does bone china body differ from porcelain body? [3]

   b) Explain the shaping and drying process followed for pottery bodies. [3]

   c) Briefly describe with a flow sheet the process of manufacture of sanitary wares. [4]

6. a) Explain the different steps involved in the manufacturing process of SiC. [4]

   b) Why SiC cannot be used as heating element above 1400^0C? [3]

   c) Why 20% Al_2O_3 remaining SiO_2 is avoided for refractory manufacturing? [3]

7. a) Explain the differences between acidic and basic refractories with suitable examples. [3]

b) Write a short notes on: [4]

i) PCE

ii) RUL

c) Explain the different steps involved in the manufacturing process of Zirconia bricks. Mention its properties. [3]

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