



Name :
Roll No. :
Invigilator's Signature :

CS/B.TECH(CT-NEW)/SEM-4/CT-402/2012

2012

PROCESS CERAMICS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$
 - i) Atterberg number is related to
 - a) total porosity
 - b) water absorption
 - c) strength
 - d) plasticity.
 - ii) Which of the following ions will be the best for helping flocculation of a slip ?
 - a) Al^{3+}
 - b) Ca^{2+}
 - c) Na^+
 - d) H^+ .
 - iii) Which of the following is not used as protective colloid ?
 - a) Sodium chloride
 - b) Sodium hexameta phosphate
 - c) Sodium silicate.

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GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

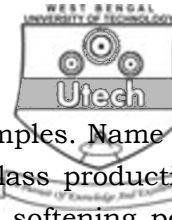
2. Define bulk density. Briefly discuss the different types of porosity in a ceramic body with sketches. How sealed pores are formed in a body ? $1 + 2 + 2$
3. Draw and describe the specific volume as a function of temp. of a glass forming liquid and crystal forming liquid and locate melting temp., glass transition region & fictive temperature.
4. Briefly describe the mechanism of flocculation and deflocculation of clay-water system with neat sketch.
5. Define sintering. What are the driving forces for sintering. $2 + 3$
6. Define plasticity. Briefly describe the direct and indirect methods of plasticity measurement of clay paste. $1 + 4$

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Name the different fabrication methods and their basic differences used in ceramic processing. Describe the working principle of spray drier with a neat sketch. Why granulation of powder is essential before pressing ? Point out the main advantages of isostatic pressing. $3 + 5 + 4 + 3$
8. What are the main objectives of firing in ceramic processing ? Briefly describe the pre-sintering stages with proper examples. Give an idea of the different categories of sintering with important characteristics. Briefly narrate the mechanism of liquid phase sintering in presence of reactive liquid. $2 + 4 + (2 \times 3) + 3$



9. Give the modern definition of glass with examples. Name five important raw materials and their role in glass production. Define annealing range, working range and softening point on the viscosity *vs* temp. plot of $\text{Na}_2\text{O} - \text{SiO}_2 - \text{CaO}$ glass.

$$(3 \times 1\frac{1}{2}) + 6 + (3 \times 1\frac{1}{2})$$

10. Write short notes on any *three* of the following : 3 × 5

- a) Deairing pug mill
- b) Filter pressing
- c) Refining of glass melt
- d) Firing of triaxial body
- e) Coarsening *vs* densification.

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