



Name :

Roll No. :

Invigilator's Signature :

CS/M.TECH (CT)/SEM-1/M(CT)-104/2010-11

2010-11

ADVANCED CERAMIC PROCESSING

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.*

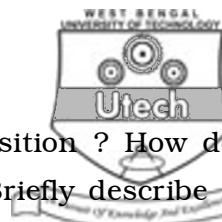
Answer any five questions.

1. What are the advantages of isostatic pressing over uniaxial / biaxial pressing ? Mention the different types of isostatic pressing methods. How do they differ from each other ? Why hot pressing is also known as pressure sintering ? Briefly describe the hot pressing equipment with sketch.

3 + 4 + 2 + 5

2. What are the main advantages of injection moulding ? Briefly discuss the mechanism of forming by injection moulding with a neat sketch. Mention the characteristics of binders required for injection moulding. What are the different types of moulding defects ?

3 + 6 + 3 + 2



3. What are the advantages of vapour deposition ? How does CVD process differ from PVD process ? Briefly describe the conventional CVD process. Describe with example different types of deposition reaction in CVD process. Mention the applications of CVD process. 3 + 2 + 4 + 3 + 2

4. What is tape casting ? What are continuous tape casting and batch doctor blade casting ? Briefly describe this method of ceramic system. How does tape casting differ from slip casting ? What are the role of binders, plasticizer and deflocculants ? 2 + 2 + 4 + 1 $\frac{1}{2}$ + 4 $\frac{1}{2}$

5. What is reactive powder ? Write the importance of emission spectroscopic technique in the chemical analysis. What is chemisorption ? How do you get specific surface area from BET equation ? Write short note on differential thermal analysis. 1 + 3 + 2 + 5 + 3

6. Name three processes used for separation of particle according to their size and explain any one method. What do you mean by agglomeration ? What are the basic differences between sol gel and co-precipitation methods ? Write short note on spray drying. 1 $\frac{1}{2}$ + 3 $\frac{1}{2}$ + 1 + 3 + 5

7. What is sintering ? What is the driving force for sintering ? Why is evaporation-condensation not considered as a sintering mechanism ? Explain the following terms :
 - i) Vitrification
 - ii) Grain growth
 - iii) Recrystallization. 1 + 2 + 2 + 3 + 3 + 3



8. Name one specific additive used for alumina sintering. Explain the role of that additive on sintering. Write short notes on the following :

i) Liquid phase densification

ii) Microwave sintering.

1 + 3 + 5 + 5

=====