Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(CT)/SEM-8/CT-801B/2010

2010

NON-OXIDE 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.

Answer any *five* questions. 5 × 14 = 70

1. What are Sialons ? How is it industrially prepared and what are their applications ? What are the other methods of preparation of Sialon ? 3 + 4 + 4 + 3

2. State the important methods of synthesis of Nitrides. Why greasy feel appears in Boron Nitride ? Discuss in details the synthesis method for production of Si_3N_4 product. 5 + 3 + 6

3. Discuss the general techniques of consolidation of powder silicides. Write in detail the manufacturing method of $MoSi_2$ including the thermal nature of the process. State the important applications and limitations of metal silicides. 5 + 5 + 4

4. Write the important methods of synthesis of carbides. Mention the important properties of carbides and also their applications. Why SiC cannot be used as heating element above 1400°C ? 5 + 6 + 3

5. What are cermets ? What are the properties required for a cermet ? What factors would you consider for formulating a cermet ? How cermets differ from conventional refractories ? What are the applications of cermets ? 1 + 2 + 5 + 3 + 3

6. How Sialon ceramics developed ? How many types of Sialons exist ? Is there any difference between the different forms of Sialons ? If so, discuss the differences in detail ? What are the methods used for consolidation of Sialon ? What are the sintering aid used during sintering of Sialon ceramics ?

2 + 2 + 1 + 5 + 2 + 2

7. What is graphitic carbon ? Discuss the essential structural features of graphite in relation to its important properties. State the effect of fabrication variables in processing during graphitization. Write in brief the thermal properties of graphite. 1 + 4 + 5 + 4