Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CT)/SEM-8/CT-801B/2012

2012

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 cermets ? What factors should be considered for compilation of cermets ? Discuss some important properties and applications of cermets. 2 + 6 + 3 + 3

2. What is the structure of graphite ? Discuss in detail the graphitization process. Briefly write some important electrical, thermal and oxidation properties of graphite.

3 + 5 + 2 + 2 + 2

3. State different methods for synthesis of nitrides. Discuss the commercial method for preparation of boron nitride. Why does greasy feel appear both in boron nitride and graphite ? Discuss any one method for the manufacture of silicon nitride product. 4 + 4 + 3 + 3

4. State important methods of synthesising 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. 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. Write the important applications and limitations of metal silicide.

4 + 6 + 4

6. What is Sialon ? What method is used for the industrial preparation of Si-Al-O-N ? What are their major applications ? What are the other methods for the preparation of Sialon ?

3 + 4 + 4 + 3

7. What are the importances of Sialon ceramics ? How many types of Sialon exists ? Is there any difference between its different forms if so discuss. What are the methods used for consolidation of Sialon ? What are the sintering aid used during sintering of Sialon ? 3 + 1 + 1 + 4 + 3 + 2