



Name :

Roll No. :

Invigilator's Signature :

CS / B.TECH (CT) / SEM-6 / CT-604 / 2011

2011

ADVANCED CERAMICS – II

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) Binder used for consolidation of MoSi_2 is
 - a) Resin
 - b) Cornflower with water
 - c) PVA
 - d) None of these.
 - ii) Nitrides of Cr, Mo and W are not considered as refractory because of
 - a) low M.P.
 - b) high dissociation pressure at high temperature
 - c) reduce easily
 - d) none of these.
 - iii) Sintering of cermet is usually carried out in
 - a) oxidising atm
 - b) reducing atm
 - c) neutral atm
 - d) none of these.

- 2



GROUP – B

(Short Answer Type Questions)

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

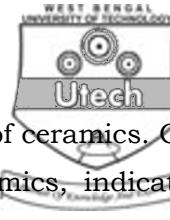
2. a) UO_2 is a better nuclear fuel than U. Explain.
b) “Montmorillonite clay can be used for the disposal of radioactive waste.” Explain.
3. a) Explain the difference between Bio-inert and Bio-active materials.
b) Calcium phosphate ceramic are widely used as Bioceramic. Explain.
4. a) “Mn is used as an active metal in the metallization of Al_2O_3 surface by Mo.” Explain.
b) “For low temperature metallization of ceramics Ag is widely used.” Explain.
5. What will happen if SiC is used as heating element $> 1400^\circ\text{C}$? What are the growing field of application of SiC ? $3 + 2$
6. Briefly discuss the synthesis method of production of Si_3N_4 body.

GROUP – C

(Long Answer Type Questions)

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

7. a) Briefly explain the mechanism of fuel cell indicating the choice of materials as cathode, anode, electrolyte and their connection.
b) Briefly describe the structure of Li-ion battery with choice of materials for different components. $8 + 7$



8. Discuss the parameters that affect the wear of ceramics. Give some examples of wear application of ceramics, indicating the choice of materials for such applications. 10 + 5
9. a) Explain the working mechanism of Ruby Laser. Discuss the advantages and disadvantages of crystallisation Laser and Glass Laser.
- b) Explain the working principle of Fibre optics. Give examples of some materials used in the fabrication of optical fibres. 8 + 7
10. What do you mean by cermet ? In what ways cermets are differ from traditional refractories ? What factors will you consider for compiling a cermet composition ? Write the applications of cermets ? How many types of cermets are there ? 1 + 3 + 6 + 3 + 2
11. Why Sialon ceramics developed ? How many types of Sialon exist ? Is there any difference between the different forms ? If so, discuss 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 + 6 + 2 + 2
12. What do you mean by graphite carbon ? Why does greasy feel appear in graphite ? Describe in brief the electrical, thermal oxidation and corrosion properties of graphite. What do you mean by white graphite and borazone ? 1 + 3 + 8 + 3

=====