

(i) Printed Pages : 3

Roll No. ....

(ii) Questions : 9

Sub. Code :

0	1	5	1
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Exam. Code :

0	0	2	8
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B.A./B.Sc. (General) 2<sup>nd</sup> Semester  
(2053)

**CHEMISTRY**

Paper : V Inorganic Chemistry-B  
(Same for B.Sc. Microbial & Food Tech.)

Time Allowed : Three Hours]

[Maximum Marks : 22

**Note :**— Attempt FIVE questions in all, including Question No. 9 which is compulsory and selecting ONE question from each unit.

**UNIT—I**

1. (a) Explain bcc and ccp type of arrangement with suitable diagrams. Where are tetrahedral and octahedral interstitial sites located in the crystal lattice ?  
(b) Write the defects in stoichiometric crystals. What are the consequences of metal excess defects ? 2,2
2. (a) Draw and explain the structure of  $\text{CaF}_2$  Using close packing model.  
(b) What are semiconductors ? Explain what is meant by n-type and p-type semiconductor ? 2,2

## UNIT—II

3. (a) How does Born Haber cycle help in the determination of lattice energy ?
- (b) Is covalent character possible in ionic compounds ? Explain polarization and polarizability giving example. 2,2
4. (a) Why silver halides AgCl, AgBr and AgI are insoluble in water but silver fluoride AgF is soluble in water ? Explain.
- (b) Explain different types of van der Waals forces. 2,2

## UNIT—III

5. (a) Define diagonal relationship. Give resemblance between boron and silicon.
- (b) Draw bonding in  $B_2H_6$  showing different parameters. 2,2
6. (a) What are carbides ? Discuss interstitial carbides.
- (b) What happens when boric acid is heated to redness ? Write the reaction. 2,2

## UNIT—IV

7. (a) (i) Discuss the trend in bond angle of hydrides of nitrogen family from top to bottom.
- (ii) Draw the structure of  $P_4O_6$  and  $P_4O_{10}$ .
- (b) Explain the structure of  $OF_2$ . Why is the bond angle of  $OF_2$  molecule smaller than that of  $Cl_2O$  ? 2,2

8. (a) Nitric acid acts only as an oxidizing agent while nitrous acid can act both oxidizing agent reducing agent. Why ?
- (b) (i)  $\text{ICl}_7$  does not exist while  $\text{IF}_7$  exists. Explain.
- (ii) Write the shape of  $\text{ClF}_4^-$  and  $\text{IF}_4^-$  2,2

### UNIT V

9. (a) What is the co-ordination number of  $\text{Rb}^+$  in  $\text{RbBr}$  and  $\text{RbI}$  ? The ionic radii of  $\text{Rb}^+$ ,  $\text{Br}^-$  and  $\text{I}^-$  ions are 1.47, 1.95 and 2.16 Å respectively.
- (b) How does solubility of ionic solids depend upon the lattice energy ?
- (c) What are the conditions for forming hydrogen bond ?
- (d) How many pentagonal and hexagonal faces are present in  $\text{C}_{70}$  and  $\text{C}_{76}$  fullerenes ?
- (e) Draw structure of borazine. Why is it called inorganic benzene ?
- (f) Why nitric acid becomes brown when released in air ?
- 6×1=6