

(i) Printed Pages : 4

Roll No. ....

(ii) Questions : 9

Sub. Code : 

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**B.A./B.Sc. (General) 2<sup>nd</sup> Semester**

**1046**

**CHEMISTRY (Same for B.Sc. Microbial & Food Tech.)**

**Paper-V : Inorganic Chemistry-B**

**Time Allowed : Three Hours]**

**[Maximum Marks : 22**

**Note :** (i) Attempt **five** questions in all, selecting **one** question from each Unit.

(ii) Unit V is compulsory.

(iii) Be brief and precise in your answers.

### **UNIT-I**

- I. (a) How many tetrahedral and octahedral voids are associated with each constituent particle in a closed packed structure ?  
1
- (b) Show how by changing the size of cation or anion, co-ordination number also changes.  
2
- (c) Give an example of compound which shows both Schottky and Frankel defects.  
1
- II. (a) What are the consequences of Schottky and Frankel defects ?  
2

- (b) Show that there are four formula units of NaCl in the unit cell of sodium chloride. 2

## UNIT-II

- III. (a) Draw Born-Haber cycle to calculate Proton-Affinity for Ammonia (out-linearly) in the formation of  $\text{NH}_4\text{Cl(s)}$ . 2
- (b) Can Ionic compounds have covalent character ? Explain Polarization and Polarizability. 2
- IV. (a) Which have high B. P. and why :
- (i) o-Nitrophenol and
- (ii) p-Nitrophenol. 1
- (b) Which have high M. P. and why :
- $\text{HgCl}_2$  and  $\text{CaCl}_2$ . 1
- (c) Why covalent or ionic bond is not possible in metals ? 1
- (d) Which had high B. P. and why-Kr or Ar ? 1

## UNIT-III

- V. (a) Why Aluminium has slightly more radius as that of Gallium ?
- (Al = 143 pm, Ga = 135 pm) 1
- (b)  $\text{H}_3\text{BO}_3 \xrightarrow{100^\circ\text{C}} ? \xrightarrow{160^\circ\text{C}} ? \xrightarrow{\text{red hot}} ?$
- Complete the reaction. 1
- (c) Draw structure of  $\text{B}_2\text{H}_6$  showing important parameters. 1

- (d) Draw structure of Borazine. Why it is called inorganic benzene ? 1

VI. (a) Why carbon does not show any tendency for complex formation whereas other elements like Si, Ge, Sn shows ? 1

(b) How  $\text{CaC}_2$  and  $\text{Al}_4\text{C}_3$  differs ? 1

(c) Write a brief note on FULLERENES. 2

#### UNIT-IV

VII. (a) Give an example of oxide of Nitrogen which have :

(i) N is + 2 oxidation state

(ii) Laughing gas

(iii) Paramagnetic

(iv) Blue solid. 2

(b) What structure  $\text{PCl}_5$  adopts in solid and vapour state ? 1

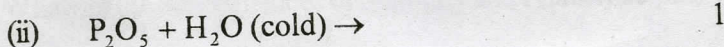
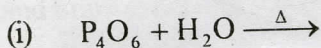
(c)  $\text{SF}_6$  have zero dipole moment whereas  $\text{SF}_4$  do not ? 1

VIII. (a) Why Interhalogens compounds are more reactive than parent halogens ? 1

(b)  $\text{I}_3^-$  is known whereas  $\text{F}_3^-$  is not known. Why ? 1

(c) Give structure of  $\text{S}_4\text{N}_4$ . 1

(d) Complete the  $r \times n$  :



## UNIT-V

- IX. (a) How many particles are there in bcc unit cell ?
- (b) Give basic difference between n-type and p-type semi conductors.
- (c) Boric acid is not a protonic acid, explain.
- (d) How many pentagonal faces and hexagonal faces are there in  $C_{60}$  fullerene ?
- (e) Arrange in order of increasing acidic strength :  
 $HClO$ ,  $HClO_3$   
 $HClO_2$ ,  $HClO_4$
- (f) What is basic structural unit of silicates ?  $1 \times 6 = 6$