

(i) Printed Pages: 3

Roll No. ....

(ii) Questions : 9

Sub. Code : 

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Exam. Code : 

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**B.A./B.Sc. (General) 2<sup>nd</sup> Semester  
(2042)**

**CHEMISTRY**

**(Inorganic Chemistry—B)**

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

**Paper-V**

**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) Draw and explain the structure of  $\text{CsCl}$  using close packing model.  
(b) How the solids are classified on the basis of electric conductivity ? 2×2
2. (a) Define with an example :  
(i) Coordination number  
(ii) Radius ratio  
(b) What are limitations of radius ratio rule ? 2×2

**UNIT-II**

3. (a) Discuss electron sea model for bonding in metal.  
(b) Define lattice energy and mention the factors on which it depends. 2×2



4. (a) Calculate the lattice energy of NaCl crystal from the following data by use of Born Haber cycle :

Sublimation energy of sodium (S) = 108.7 KJ/mol

Dissociation energy of chlorine (D) = 225.9 KJ/mol

Ionization energy of sodium (IE) = 489.5 KJ/mol

Electron affinity of chlorine (EA) = 351.4 KJ/mol

- (b) What is hydrogen bond ? Discuss its types and explain necessary condition for formation of hydrogen bonding.

2×2

### UNIT-III

5. (a) Explain the following :

(i)  $\text{N}(\text{CH}_3)_3$  is pyramidal but  $\text{N}(\text{SiH}_3)_3$  is trigonal planar.

(ii) Why is Boron unable to form  $[\text{BF}_6]^{3-}$  ion ?

- (b) How do  $\text{CaC}_2$  and  $\text{Al}_4\text{C}_3$  differ ?

2×2

6. (a) Explain the following :

(i) Why is  $\text{BF}_3$  weaker acid than  $\text{BCl}_3$  ?

(ii)  $\text{CCl}_4$  cannot be hydrolysed but  $\text{SiCl}_4$  can be easily hydrolysed. Why ?

- (b) How many pentagonal and hexagonal faces are there in  $\text{C}_{60}$  fullerene ?

2×2

### UNIT-IV

7. (a) Explain the structure of  $\text{PCl}_5$  in solid and vapour state.

(b) Compare the acidic strength of oxo acid of chlorine.

2×2



8. (a) Draw the structure of  $\text{H}_3\text{PO}_2$  and  $\text{HNO}_2$  and also give their Basicity.
- (b) How does  $\text{H}_2\text{SO}_4$  act as an oxidizing agent ? Give example to show its oxidizing character. 2×2

### UNIT-V

9. (a) Which of two  $\text{HgCl}_2$  and  $\text{CaCl}_2$  has higher melting point ? Explain.
- (b) Between  $\text{CaF}_2$  and  $\text{CaC}_2$  has more ionic, why ?
- (c) Ionic radii of  $\text{Rb}^+$  and  $\text{Br}^-$  is  $1.47\text{\AA}$  and  $1.95\text{\AA}$  respectively, predict the structure of  $\text{RbBr}$ .
- (d) Why boron chloride is monomeric while aluminium chloride is dimeric ?
- (e) Why are inter halogen compounds more reactive than parent halogen ?
- (f) Why does  $\text{I}_2$  dissolve in  $\text{KI}$  solution ? 1×6