

(i) Printed Pages : 4

Roll No.

(ii) Questions : 9

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Exam. Code :

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B.A./B.Sc. (General) 2nd Semester

1048

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 (Unit-V) which is compulsory and selecting **one** question each from Units I-IV.

UNIT-I

1. (a) Draw neat diagram for NaCl and CsCl structure. What is the basic difference between the two structures ?
(b) What are stoichiometric compounds ? Discuss the Frenkel defects. 2,2
2. (a) What are semiconductors ? Discuss mechanism of intrinsic and extrinsic semiconductors.
(b) (i) What are the limitations of radius ratio rule ?

- (ii) A solid is made up of two elements X and Y. Atoms Y are in CCP arrangement while atoms X occupy all the tetrahedral sites. What is the formula of the compound ? 2,2

UNIT-II

3. (a) What is hydrogen bond ? Discuss two types of hydrogen bonds. Give two examples of each type.
- (b) Calculate the lattice energy of KCl crystal from the following data
- Sublimation energy of K(S) = 102.5 kJ/mol
- Dissociation energy of $\text{Cl}_2(\text{D})$ = 230.5 kJ/mol
- Ionization energy of K(g) (I) = 450.6 kJ/mol
- Electron affinity of Cl(g) (E) = -350.2 kJ/mol
- Heat of formation of KCl (4H_f) = -420.4 kJ/mol. 2,2
4. (a) Why solubilities of halides of silver in water are low while that of alkali metal halides are very high ?
- (b) Explain different types of van der Waals forces. 2,2

UNIT-III

5. (a) (i) Boron forms no compounds in unipositive state but lithium in unipositive state is quite stable.
- (ii) What happens when boric acid is heated to redness ? Write the reaction.

- (b) Discuss the structure of borazine. Why is it called inorganic benzene. 2,2

6. (a) Explain the following :

- (i) $[\text{AlF}_6]^{3-}$ exists whereas $[\text{BF}_6]^{3-}$ does not.
(ii) How do the carbides CaC_2 and Al_4C_3 differ ?
(b) (i) Define diagonal relationship. Give resemblance between boron and silicon.
(ii) What are fluorocarbons ? Name one fluorocarbon which is used as a refrigerant. 2,2

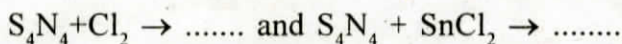
UNIT-IV

7. (a) Discuss the structure of OF_2 . Why is the bond angle of OF_2 molecule smaller than that of Cl_2O ?

- (b) (i) Write two reactions of H_2SO_4 acts as an oxidising agent.
(ii) Why SF_6 has zero dipole moment while SF_4 has non-zero dipole moment ? 2,2

8. (a) (i) Write formulae of oxoacids of chlorine. Explain the trend of their acid strength giving reason.

(ii) Complete the reaction



(b) (i) What are interhalogen compounds ? Give suitable example.

(ii) I_3^- is known whereas F_3^- is not known. Why ?

2,2

UNIT-V

9. (a) The radii of Mg^{++} and O^{--} are 0.66\AA and 1.40\AA . Predict the probable type of the site occupied by Mg^{++} ions.
- (b) Cu^+ and Na^+ are of the same size but CuCl is insoluble while NaCl is soluble in water. Explain.
- (c) How many pentagonal and hexagonal faces are present in C_{70} and C_{76} fullerenes ?
- (d) Which out of CCl_4 and SiCl_4 can be easily hydrolysed and why ?
- (e) Why bleaching action of SO_2 is temporary process ?
- (f) Why concentrated nitric acid becomes yellow on exposure to sunlight ?

$$6 \times 1 = 6$$