

CHEMISTRY Paper-V

(Inorganic Chemistry-B)

Time Allowed : 3 Hours

Maximum Marks : 45

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

(ii) UNIT-V is compulsory.

(iii) Simple calculator is allowed.

UNIT-I

- (a) Differentiate between tetrahedral and octahedral voids. 3
(b) What is doping? Explain with example. 3
(c) Define SCHOTTKY and FRENKEL defects. 3
- (a) Draw a neat diagram of zinc sulphide crystal. 3
(b) What are the limitations of radius ratio rule? 3
(c) What is *n*-type semiconductor? Explain with an example. 3

UNIT-II

- (a) Why other silver halides are insoluble in water but silver fluorid is soluble in water? Explain. 5
(b) Explain polarisation and polarising power. 4
- (a) Give a brief account of band theory of banding in solids. 4
(b) Calculate Lattice energy of NaCl when modeling constant is 1.748 internuclear distance is 0.2814 nm and Born exponent is 9. 5

UNIT-III

- (a) Discuss the ability of group 14 elements to form complexes. 5
(b) Why does property of catenation for group 14 follow the order :
 $C \gg Si > Ge > Sn > Pb$ 4
- (a) The structure of trimethylamine is pyramidal while that of trisilylamine is planar although C and Si both belong to the same family. 5
(b) Write a note on cyclic silicates. 4

7. (a) Al forms AlF_6^{-3} but B does not form BF_6^{-3} ion. Explain. 4
 (b) Out of BF_3 , BCl_3 , BBr_3 , which is not easily hydrolysed and why? 5
8. (a) Why are, interhalogens more reactive than parent halogens? 3
 (b) ICl_7 does not exist while IF_7 exists. Explain. 3
 (c) Out of IBr and ClF which is more stable and why? 3

UNIT-V

9. (a) Out of NaCl and CsCl which has higher coordination number of Cl ?
 (b) n-type semiconductor is obtained by adding Si with atoms of which element?
 (c) Name an inorganic compound which is hard and can be used as abrasive.
 (d) Name a compound which shows both Schottky and Frenkel defects.
 (e) Name the most important factor that governs the value of modeling constant.
 (f) How many Na^+ and Cl^- ions are present in a unit cell of NaCl ?
 (g) What are imperfections or defects?
 (h) What is a unit cell?
 (i) Name one oxoacid of sulphur. $9 \times 1 = 9$