(i) Printed Pages : 4 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 1 4 9

Exam. Code : 0 0 0 2

B.A./B.Sc. (General) 2nd 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 $NH_4Cl(s)$. 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 :

$HgCl_2$ and $CaCl_2$. 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) $H_3BO_3 \xrightarrow{100^\circ C} ? \xrightarrow{160^\circ C} ? \xrightarrow{\text{red hot}} ?$

Complete the reaction. 1

(c) Draw structure of B_2H_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 CaC_2 and Al_4C_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) Lavghing gas

(iii) Paramagnetic

(iv) Blue solid. 2

(b) What structure PCl_5 adopts in solid and vapour state? 1

(c) SF_6 have zero dipole moment whereas SF_4 do not? 1

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

(b) I_3^- is known whereas F_3^- is not known. Why? 1

(c) Give structure of S_4N_4. 1

(d) Complete the r × n :

(i) $P_4O_6 + H_2O \xrightarrow{\Delta}$

(ii) $P_2O_5 + H_2O$ (cold) $\rightarrow$ 1

UNIT–V

IX. (a) How many particules 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 ? $1 \times 6 = 6$