(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 0 4 8

Exam. Code : 0 0 0 1

B.A./B.Sc. (General) 1st Semester

1125

CHEMISTRY (Same for B.Sc. Microbial and Food Tech.)

Paper–I : Inorganic Chemistry-A

Time Allowed : Three Hours] **[Maximum Marks : 22**

Note : (1) Attempt **five** questions in all, selecting **one** question from each Unit.

(2) Unit (V) is compulsory.

UNIT–I

I. (a) Write relation between Cartesian co-ordinates and spherical polar co-ordinates with diagram. 2

(b) Write quantum numbers for the orbital 2Pz. 1

(c) How many Nodal planes are there in S orbital ? 1

II. (a) Write notes on Radial Wave Function and Angular Wave Function. 2

(b) Draw Radial Probability Distribution curve for 3d orbital. 1

(c) Give expression for de-Broglie Equation and Heisenberg Uncertainty Principle. 1

UNIT–II

III. (a) Calculate Effective Nuclear charge of 3P electron in phosphorous elements. 2

(b) Which have more Ionization Energy : N or O and why ? 1

(c) Which have smaller size : Ne or F ? 1

IV. (a) Which is more electronegative : C_2H_2 or CH_4 ? 1

(b) How many elements are there in p-block ? 1

(c) What is difference between Electron Affinity and Electronegativity ? Calculate electronegativity of chlorine from following data :

$E_{Cl-Cl} = 58.25$ K.Cal/mole

$E_{H-H} = 104.2$ K.Cal/mole

$E_{H-Cl} = 103.28$ K.Cal/mole. 2

UNIT–III

V. (a) Discuss structure and bonding of XeO_3 molecule. 2

(b) Complete the reactions :

(i) $XeF_6 + 3H_2O \rightarrow$

(ii) $XeF_4 + SbF_5 \rightarrow$ 1

(c) Why do most of compounds involve Xenon, Fluorine and Oxygen ? 1

VI. (a) Why Lithium is strongest reducing agent among alkali metals ? 2

(b) Write brief note on CRYPTATES. 1

(c) Alkali metals when dissolved in Ammonia give blue colour solution, why ? 1

UNIT–IV

VII. (a) Draw molecular orbital diagram of HF molecule. 2

(b) Why in some covalent compound, ionic character is there ? 1

(c) Why bond angle in H_2O is more as compared to H_2S ? 1

VIII. (a) Discuss bonding and shape of ClF_3 molecule on basis of VSEPR theory. 2

(b) Calculate percentage of ionic character in XY molecule if dipole moment of XY molecule is 2.3 D and bond distance is 1.5 Å. 2

UNIT–V (Compulsory)

IX. (a) Arrange in order of increasing basic character

$Ba(OH)_2$, $Ca(OH)_2$, $Mg(OH)_2$. 1

(b) How many Lone pair and Bond pair of $\bar{e}$ are there in H_2O ? 1

(c) Which is more hydrated and why -Li^+ and Cs^+ ? 1

(d) Define Eigen Values and Eigen Function. 1

(e) Give biological functions of Ca^{2+} and Mg^{2+} ions. 1

(f) What is difference between atomic orbital and molecular orbital ? 1