**91033**

**B.Sc. 1st Semester (Hons) Examination,**

**November–2014**

**CHEMISTRY**

**Paper–I**

**Inorganic Chemistry**

*Time allowed : 3 hours]* *[Maximum marks : 40*

***Note :*** *Attempt **five** questions in all, **Question 1 is compulsory.** Select **one** question from each section.*

1. (a) What is the co-ordination number of tetrahedral void ? 1×8=8

   (b) What is the other name of Double Quartet theory ?

   (c) Which rule violates in: $1s^1\ 2s^2$ ?

   (d) Define Successive ionization energy.

   (e) What is the physical significance of wave function ?

   (f) Which element has maximum electron affinity in the Group-16 of periodic table ?

   (g) Which of the following have regular geometry : Ammonia or $BF_3$.

   (h) Write the valence shell configuration of Chromium.

**Section–I**

2. (a) Write all the postulates of Bohr's theory. 3,3,2

(b) Define :

(i) Normal wave function

(ii) Orthogonal wave function

(iii) Quantum numbers

(c) Why half filled configurations are more stable ?

3. (a) Calculate the effective nuclear charge experienced by : 6,2

(i) 1s electron in Hydrogen

(ii) 3d electron in Zn-atom

(iii) 2p electron in Aluminium

(b) Explain the following with examples :

(i) Hund's rule

(ii) Aufbau Principle

## Section–II

4. (a) Explain the shape of : 4,4

(i) Ammonia

(ii) Water on the basis of hybridization.

(b) Draw the M.O. diagram of $He_2$ and find out : Bond order, magnetic behavior.

5. (a) Give reason for the following : 4,4

(i) Boiling point of $H_2O$ is higher than HF.

(ii) Dipole moment in $BF_3$ is zero.

(b) Explain the Bond order, magnetic behaviour in CO using M.O. diagram.

## Section–III

6. (a) Explain the structure of 4,4

(i) CO

(ii) $F_2$ on the basis of Linnett's theory.

(b) Give the differences in between the properties of s-block and p-block elements.

7. (a) Give reason to following :

(i) Electron affinity of O-atom is less than S-atom.

(ii) Electron affinity of N-atom is almost zero.

(iii) Size of cation is smaller than neutral atom.

(b) Why van der Waal radii is larger than covalent radii ?

## Section–IV

8. (a) Explain the conductivity in sodium using Band theory. 3,3,2

(b) Give the differences in between Schotky defect and Frenkel defect.

(c) Explain the order of covalent character among NaF, NaCl, NaBr, NaI.

9. (a) Explain the effect of temperature on the conductivity of conductors, semiconductors using Band theory. 3,3,2

(b) Define with an example :

(i) Co-ordination number

(ii) Radius ration

(iii) Polarisation

(c) Explain the effect of increase and decrease of pressure on co-ordination number.