Roll No. ....

91033

B.Sc. (Hons.) Chemistry
Ist Semester w.e.f. 2012-13
Examination – November, 2018

CHEMISTRY (INORGANIC CHEMISTRY)

Paper : P-I

Time : Three Hours] *[Maximum Marks : 40*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. **1** is *compulsory*. All questions carry equal marks.

1. (a) Define Orbital.
   (b) Draw the structure of d_{xy} orbital.
   (c) What is intramolecular hydrogen bonding ?
   (d) What is the shape of ClF_3 molecule ?
   (e) Out of nitrogen and oxygen atom, which is smaller in size ?
   (f) Arrange the following in increasing order of electron affinity :
   Br, Cl, F, I
   (g) What is body centered cubic arrangement ?
   (h) What are semi conductors ? 1×8=8

P. T. O.

SECTION – A

2. (a) Write the value of *n* and *l* for the following subshell : 5
   (i) 2p
   (ii) 6d
   (iii) 5f
   (iv) 6p
   (v) 3d
   (b) State and explain Heisenberg uncertainty principle. 3

3. (a) Describe : 4
   (i) Aufbau principle.
   (ii) Pauli exclusion principle.
   (b) Explain the significance of de-Broglie equation. 2
   (c) Write all the possible values of quantum number *n, l, m* and *s* for an electron in 4*f* orbital. 2

SECTION – B

4. (a) Compare the structure of NH_3, H_2O and H_3O using VSEPR theory. 5
   (b) Draw the MO diagram of *CO* and calculate its bond order. 3

5. (a) Explain the hybridisation and structure of PCl_5 molecule. 3
   (b) Calculate the percentage ionic character in *Cs-F* bond in *CsF* molecule. The electronegativity value of *Cs* and *F* are 0.7 and 4.0 respectively. 3
   (c) What are Van der Waals forces ? 2

SECTION – C

6. (a) Give reason : 4

(i) The second ionization energy of sodium is very high as compare to first one

(ii) Size of Na^+ is less than Na.

(b) Define electron affinity. Describe the various factors on which it depends. 4

7. (a) What is Linnett theory ? Explain the structure of N_2 using it. 4

(b) What is Electronegativity ? Discuss its variation in a period and group. 4

SECTION – D

8. (a) Draw and discuss the structure of $NaCl$. 4

(b) Explain briefly : 4

(i) Fajans rule.

(ii) Metallic bonding.

9. (a) Explain how Born-Haber cycle is used for calculating the lattice energy of $NaCl$? 4

(b) Describe : 4

(i) Schottky defect.

(ii) Frenkel defect.