GEI- CHEMISTRY-I-CODE: BHB4

Max. Marks: 74   Time: 3Hrs.

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B sections.

Section – A

1. Explain the following:
   (a) Aufbau and Pauli exclusion principle?   4
   (b) Heisenberg uncertainty principle   4
   (c) Half filled and fully filled orbitals have greater stability than other configuration? 3
2. Explain the following:
   (a) Localized and delocalized chemical bond with examples?   5
   (b) Hyperconjugation and its applications   6
3. (a) Discuss structural differences in solid, liquid and gases?   5
   (b) Discuss postulates of kinetic theory of gases?   6
4. (a) Discuss Vanderwaals equation of states?   6
   (b) Write a note on liquefication of gases?   5

Section – B

5. (a) Discuss isomerism in alkanes?   3
   (b) Write three chemical reactions of alkanes?   4
   (c) Discuss relative stabilities of alkenes?   4
6. (a) Discuss chemical reactions of alkene   5
   (b) Discuss chemical reactions of alkyne and comment on acidity of alkynes? 6
7. Write a note on the following
   (a) optical activity   5
   (b) Dipole and induce dipole moment?   6
8. (a) Discuss temperature method for dipole measurement?   5
   (b) Discuss Paramagnetism, ferromagnetism and anti-ferromagnetism?   6

Section – C

9. Attempt all questions:- $15 \times 2 = 30$
(i) Draw shapes of d-orbitals?
(ii) Write electronic configuration for Cu^{+2} and Cr^{+2}?
(iii) Discuss atomic and ionic radii?
(iv) Write a note on aromaticity?
(v) Discuss inductive effect?
(vi) Discuss intermolecular forces of attraction?
(vii) Discuss root mean square and most probable velocities?
(viii) Discuss physical properties of alkanes?
(ix) Discuss physical properties of alkanes?
(x) What do you meant by Polarisation?
(xi) Discuss refractivity method for dipole moment measurement?
(xii) Why BF_3 has zero dipole moment?
(xiii) Explain the effect of temperature on dipole moment?
(xiv) Discuss effect of electric field on orientation of dipoles?
(xv) Discuss Diamagnetism?