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1594/M

L-26/2051

INORGANIC CHEMISTRY

Paper–FYBOT-TP-204

Semester–II

Time allowed : 3 Hours] [Maximum Marks : 60

Note : The candidates are required to attempt two questions each from section A and section B carrying 9 marks each and the entire section C consisting of 12 questions carrying 2 marks each.

SECTION-A

1. What do you understand by Radial Probability Distribution Curves? Explain with the help of *p* and *d* Orbital Curves. 9

2. Covalent bonds are known as directional bonds. Explain the statement with the help of appropriate example. 9

3. Show the crystal field splitting of d orbitals under octahedral and tetrahedral field. List the three factors that will effect the magnitude of crystal field splitting. 9

4. Classify the acid and base on the basis of Lowry and Bronsted theory? What are the important limitations of the theory? Classify the followings into Lewis or Bronsted acids/bases: HCl, NH_3, BH_3,CO_2, $NaOH_2$, SO_2. 9

SECTION-B

5. How will you explain the variation in reducing nature, flame color and strength of hydroxides, on moving top to bottom in group-I of periodic table, explain? 9

6. Give the synthesis of the followings : 9

   (i) diborane

   (ii) fluorocarbon

   (iii) cyclic silicates

   (iv) linear chain silicones

7. Discuss the variation in the following properties of d-block elements:

(i) atomic size

(ii) electronic configuration

(iii) paramagnetic behavior. 9

4. Explain the following isomerism with appropriate examples:

(i) Coordination position isomerism

(ii) hydration isomerism

(iii) optical isomerism. 9

SECTION-C

9. Attempt all questions : 12×2 = 24

(i) What is the significance of ², explain.

(ii) With the help of hybridization involved predict the shape of NH_3 molecule.

(iii) On the basis of VSEPR theory explain the geometry of H_2O molecule.

(iv) List the factors that may affect the extent of crystal field splitting.

(v) Which of the following can act as Lewis bases, give reason: NH_3, CO_2, OH^-, Ag^+.

(vi) Explain why Ca is more reactive than Mg?

(vii) Give the synthesis of fluorocarbons.

(viii) Transition metal are less reactive in comparison to s block elements, explain?

(ix) Explain the trends in atomic radii of lanthanides on moving left to right.

(x) Write the IUPAC name of the following complexes:

(i) $[Fe(CO_3)(NH_3)_4]Cl$

(ii) $[CO(NH_3)_6]Cl_3$.

(xi) Give the crystal field splitting of d-orbitals under tetrahedral field.

(xii) How the ligand are classified as unidentate, bidentate and polydentate.