M.Sc (Organic Chemistry) DEGREE EXAMINATIONS – MARCH 2024

FIRST SEMESTER

INORGANIC CHEMISTRY

Time: 3 Hours | Max Marks: 70

SECTION - A

Answer the following: 5 X 4 = 20 M

1. (a) Derive the Schrodinger wave equation.
   Or
   (b) Explain Eigen values and Eigen functions.

2. (a) Explain synthesis, properties and structure of Borazines.
   Or
   (b) Write the spectral and magnetic properties of lanthanides.

3. (a) Draw and explain the molecular orbital diagram of BeH_2 molecule.
   Or
   (b) Write a note on cohesive forces.

4. (a) Write the applications and limitations of CFT.
   Or
   (b) Discuss the experimental evidence for π-bonding in complexes.

5. (a) What is Chelate effect? Explain with an example.
   Or
   (b) What are stepwise and overall stability constants? Derive relationship between them.

SECTION-B

Answer the following: 5 X 10 = 50 M

6. (a) Discuss the solution of Schrodinger wave equation to Particle in a three dimensional box.
   Or
   (b) What is first order Perturbation theory? Explain.

7. (a) Write the synthesis and Properties of S-N and P-N cyclic compounds.
   Or
   (b) Explain Dinitrogen and Dioxygen complexes with suitable examples.

8. (a) How do you predict shapes of molecules using VSEPR theory? Explain with suitable examples.
   Or
   (b) Draw the Walsh diagram of H_2O molecule.

9. (a) What is meant by CFSE? Write the differences between the crystals field splitting of d-orbitals in Octahedral and tetrahedral geometries.
   Or
   (b) Explain John-Teller effect and its applications.

10. (a) How can you determine two components simultaneously present in a mixture by Spectrophometric method?
    Or
    (b) What are hard-soft acids and bases? Discuss the principle and applications of HSAB.

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