Department of Chemistry

B.Sc. Semester III 2024-2025

Question Bank

Unit I

1. Write short notes on –
   a) Diagonal relationship between Li and Mg
   b) Solvation tendency of s block elements
   c) Function of s block elements in biosystem

2. Write short note on –
   a) Borazine
   b) Fullerenes
   c) Carbides

3. Give the methods of preparation and properties of XeF_2 and XeF_4. Discuss their structures also.

Unit II

4. a) What do you maen by frost diagram? Explain the utility of Latimer diagram in construction of frost diagram?
   b) Draw Pourbaix diagram of Mn and explain it.

5. Write short note on –
   a) Metal – ammonia solutions
   b) Levelling and differentiating solvents
   c) Classification of solvents

6. Write short note on –
   a) Isotopes and isobars
   b) Magic number
   c) Half-life period and average life as applied to radioactive element
   d) Nuclear fission and Nuclear fusion

Unit III

7. a) Explain the reactivity and selectivity with the help of chlorination and bromination of isobutene.
   b) Explain Baeyer's strain theory.

8. a) Give the mechanism of reaction of propene with HBr in presence and absence of peroxide.

b) Explain the mechanism of 1,2- and 1,4- electrophilic addition reaction by taking the example of addition of bromine on 1,3-butadiene. How does the composition of the two products depend on temperature?

9. Alkynide ion gives substitution with primary alkyl halides and elimination reaction with s- and t-alkyl halides, why? Explain by giving mechanism of both the type.

Unit IV

10. Derive Kirchoff's equation. Deduce relation between heat of reaction at constant pressure and heat of reaction at constant volume.

11. Explain Joule–Thomson's effect. Calculate Joule–Thomson's coefficient using Van der Waals equation

12. What are abnormal molecular masses? How will you determine the degree of dissociation and degree of association of a solute with the help of Van't Hoff factor?