

B.Sc. Semester - 3 (CBCS) Examination
Oct/Nov - 2023 (OLD COURSE)
CHEMISTRY (CORE)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1(A) Answer the following question. (04)
1. Define Eigen function and Eigen value and write equation for Normalized and Orthogonal condition.
- Que.1(B) Answer the following question. (Any two) (10)
1. Derive wave function and co-efficient of sp hybridization.
2. Derive wave function of H₂ molecule.
3. Derive Schrodinger's wave equation in three dimensions (Cartesian co-ordinate).
- Que.2(A) Answer the following question. (04)
1. Write note on Misch metals.
- Que.2(B) Answer the following questions. (Any two) (10)
1. Write any five uses of lanthanides.
2. Discuss benzyne mechanism in detail.
3. Explain lanthanide contraction in detail.
- Que.3(A) Answer the following question. (04)
1. Explain Hinsberg reaction in detail.
- Que.3(B) Answer the following questions. (Any two) (10)
2. What is diazotization? Write any four reactions of diazonium salt.
3. Explain Williamson Synthesis for preparation of ethers.
4. Explain nitration and halogenation reactions of phenols.
- Que.4(A) Answer the following question. (04)
1. Write equation of phase rule and define phase, component and degree of freedom.
- Que.4(B) Answer the following questions. (Any two) (10)
1. Explain Pinacol-Pinacolone rearrangement with mechanism.
2. Describe phase diagram of water system.
3. Explain phase diagram of Na-K system.
- Que.5(A) Answer the following question. (04)
1. Explain factors affecting solubility of solid, liquid and gases substances.
- Que.5(B) Answer the following questions. (Any two) (10)
1. Explain positive and negative deviation from Raoult's Law.
2. Derive Nernst distribution law and state its limitations.
3. Discuss Henry's law in detail.
