

**B.Sc. Semester - 3 (CBCS) Examination**  
**Oct/Nov - 2025 [New Course]**  
**Chemistry-C301(Core)**

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

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

|          |                                                                                                                     |      |
|----------|---------------------------------------------------------------------------------------------------------------------|------|
| Que.1(A) | Answer the following question.                                                                                      | (04) |
|          | 1) Calculate magnetic moment for a) $\text{Sc}^{3+}$ b) $\text{Mn}^{2+}$ c) $\text{Ni}^{2+}$ d) $\text{Zn}^{2+}$    |      |
| Que.1(B) | Answer the following questions. (Any two)                                                                           | (10) |
|          | 1) Discuss Color properties of 3d transition series.                                                                |      |
|          | 2) Write postulates of wave mechanics.                                                                              |      |
|          | 3) Discuss Normalization condition in wave mechanics                                                                |      |
| Que.2(A) | Answer the following question.                                                                                      | (04) |
|          | 1) Write short note on Lucas test.                                                                                  |      |
| Que.2(B) | Answer the following questions. (Any two)                                                                           | (10) |
|          | 1) What is diazotization? Write any four applications of diazonium salt.                                            |      |
|          | 2) Write short note on Reimer Tiemann reaction.                                                                     |      |
|          | 3) Discuss relative reactivity of alkyl, benzyl, vinyl and aryl halide towards nucleophilic substitution reactions. |      |
| Que.3(A) | Answer the following question.                                                                                      | (04) |
|          | 1) Explain factors affecting solubility.                                                                            |      |
| Que.3(B) | Answer the following questions. (Any two)                                                                           | (10) |
|          | 1) Discuss Henry's Law with limitations.                                                                            |      |
|          | 2) Explain phase diagram of water system.                                                                           |      |
|          | 3) Explain the variation of Nernst Distribution law.                                                                |      |
| Que.4(A) | Answer the following question.                                                                                      | (04) |
|          | 1) Write short note on Misch metal.                                                                                 |      |
| Que.4(B) | Answer the following questions. (Any two)                                                                           | (10) |
|          | 1) Explain electronic configuration of Lanthanide series.                                                           |      |
|          | 2) Differentiate $1^\circ$ , $2^\circ$ and $3^\circ$ amines with the help of Hinsberg reagent.                      |      |
|          | 3) Discuss simple Eutectic system with phase diagram.                                                               |      |
| Que.5(A) | Answer the following question.                                                                                      | (04) |
|          | 1) Discuss Williamson Ether Synthesis.                                                                              |      |
| Que.5(B) | Answer the following questions. (Any two)                                                                           | (10) |
|          | 1) Discuss use of Lanthanides and their compounds.                                                                  |      |
|          | 2) Discuss Pinacol-Pinacolone Rearrangement.                                                                        |      |
|          | 3) Differentiate Positive and Negative deviation.                                                                   |      |

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