

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Winter 2022 - 23 Examination**

**Semester: 1**  
**Subject Code: 303103101**  
**Subject Name: Chemistry**

**Date: 25/01/2023**  
**Time: 02.00pm to 4:30pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions****(15)**

- 1) By adding electron to neural molecule which reactive intermediate is formed
  - a) Free Radical
  - b) Carbocation
  - c) Carbene
  - d) Carbanion
- 2) \_\_\_\_\_ Hybridization gives tetrahedral shape.
  - a) SP
  - b) SP<sup>2</sup>
  - c) SP<sup>3</sup>
  - d) dSP<sup>2</sup>
- 3) If two compounds are Mirror image of each other and non-superimposable then they are,
  - a) Enantiomers
  - b) Diastereomers
  - c) Both a) & b)
  - d) Neither a) nor b)
- 4) Full form of LUMO is
  - a) Linear Unoccupied Molecular Orbital
  - b) Lowest Unoccupied Molecular Orbital
  - c) Lowest Uncovered Molecular Orbital
  - d) Linear Uncovered Molecular Orbital
- 5) As the pressure increases the rate of the reaction
  - a) Decreases
  - b) Increases
  - c) Remains same
  - d) Increase-Decrease
- 6) Electrode potential of standard Calomel electrode is \_\_\_\_\_.
- 7) Example of Ionic Bond is \_\_\_\_\_.
- 8) The internal resistance is \_\_\_\_\_ for the secondary cell.
- 9) Magnetic Property of O<sub>2</sub> molecule is \_\_\_\_\_.(Diamagnetic/Paramagnetic)
- 10) The Shape of the molecule PCl<sub>5</sub> molecule is \_\_\_\_\_.
- 11) Which is less acidic in halogen for Inductive effects?
- 12) In EMF Series Li has electrode potential of -3.05, whereas K has electrode potential of -2.93 which one is More Reactive?
- 13) Write schrodinger wave equation.

14) Write Nernst's Equation.

15) Write definition of Enantiomers & Diastereomers.

Q.2 Answer the following questions. (Attempt any three) (15)

A) Explain various factors affecting the rate of reaction. (Any five factors)

B) Write a note on "Electrochemical cell" With all labeling Diagram.

C) What is ligand effect and explain effect of ligand in rate of reaction.

D) Explain generation of Carbonium ion and discuss its stability.

Q.3 A) Derive Nernst equation. (07)

B) Draw the Diagram of O<sub>2</sub> Molecule. Calculate its bond order and discuss its magnetic property. (08)  
OR

B) Draw the Diagram of N<sub>2</sub> Molecule. Calculate its bond order and discuss its magnetic property. (08)

Q.4 A) Draw conformation of Acyclic compound ethane. (Newmann's projection) (07)

OR

A) Draw all conformation of cyclic compound Cyclohexane. (07)

B) Explain reactions i) Substitution reaction ii) Elimination reaction (08)