

B.Sc. (FS) Semester - 1 (NEP-2020) Examination**OCT/NOV-2025****Chemistry (Minor)****Time: 2:00 Hours****Marks:50****Instructions:**

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

Que.1 Answer the following questions. (5 marks each) (10)

1. Explain ionization potential and discuss the variation of ionization potential in group and period.
2. Define hybridization and discuss sp^2 Hybridization with appropriate examples.

OR

Que.1 Answer the following questions. (5 marks each)

1. Discuss all four quantum numbers in detail.
2. Draw the energy level diagram of the O_2 molecule and calculate its bond order and magnetic momentum.

Que.2 Answer the following questions. (5 marks each) (10)

1. Discuss the Wurtz and Wurtz–Fittig reactions for alkane synthesis.
2. Give the differences between SN^1 and SN^2 reactions.

OR

Que.2 Answer the following questions. (5 marks each)

1. Define the inductive effect and describe its types.
2. Explain the structural and stereochemical differences between enantiomers and diastereomers, and give suitable examples for each.

Que.3 Answer the following questions. (5 marks each) (10)

1. Give the general characteristics of catalytic reactions.
2. Explain Tyndall effect and Brownian movement with examples.

OR

Que.3 Answer the following questions. (5 marks each)

1. Write short notes on auto-catalysis, promoters, and catalytic poisoning, with suitable examples for each.
2. Define molarity, normality, molality and % w/v, with suitable examples for each.

Que.4 Answer the following questions. (5 marks each) (10)

1. Write a detailed note on the Aufbau principle.
2. Give the preparation of alkyl halides

OR

Que.4 Answer the following questions. (5 marks each)

1. Write the differences between bonding and antibonding molecular orbitals.
2. Briefly explain substitution, addition, elimination, and rearrangement reactions and give one suitable example for each.

Que.5 Answer the following questions. (5 marks each) (10)

1. Explain adsorption isotherms.
2. What is a carbocation? Explain the structure and stability of primary, secondary, and tertiary carbocations with suitable examples.

OR

Que.5 Answer the following questions. (5 marks each)

1. Explain Mesomeric effect & Hyperconjugation.
2. Give the difference between Chemisorption and Physisorption.
