

## B.Sc. Semester – 1 (NEP-2020) Examination

January-2024

## Introductory 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. (10)

- (A) Explain any two quantum numbers.
- (B) Draw the MOT diagram of  $O_2$  Molecule and calculate its bond order, HOMO- LUMO orbitals and magnetic properties.

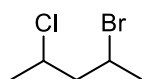
OR

Que.1 Answer the following questions.

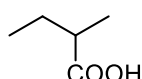
- (A) Write a note on Aufbau's Principle and Hund's rule.
- (B) Explain  $sp^2$  hybridization with example.

Que.2 Answer the following questions. (10)

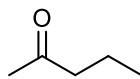
- (A) Give IUPAC Name of the following.



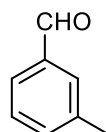
(i)



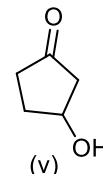
(ii)



(iii)



(iv)



(v)

- (B) Define constitutional isomers and explain chain, positional, and functional group isomerism with examples.

OR

Que.2 Answer the following questions.

- (A) Write a short note on carbocation and Carbanion.
- (B) Explain differences between  $SN^1$  and  $SN^2$  Reaction.

Que.3 Answer the following questions. (10)

- (A) Explain purification of colloidal solution by Electro-dialysis and Ultrafiltration.
- (B) Write a note on Characteristics of Catalysis.

OR

Que.3 Answer the following questions.

- (A) Write a short note on Tyndall effect and Brownian movement.
- (B) Define the terms: Adsorption, Absorption, Adsorbent, Adsorbate, Sorption.

Que.4 Answer the following questions. (10)

- (A) Give the hybridization and shape of given molecules:  $BCl_3$ ,  $PCl_5$ ,  $SF_6$ ,  $CO_2$ ,  $NH_3$ .
- (B) Explain four types of organic reactions with example.

OR

Que.4 Answer the following questions.

- (A) Give the difference between bonding and anti-bonding molecular orbital.
- (B) Define the terms with examples: Nucleophiles, Electrophiles, Enantiomers, Diastereomers, Heterolytic fission.

Que.5 Answer the following questions. (10)

- (A) Define the terms Molarity and Normality, and calculate the molarity of a solution in which 116.8 grams of NaCl is dissolved in 1 liter of water, (Where Na = 23.0 gm/mole, Cl=35.5 gm/mole).
- (B) Explain Free radical substitution reaction.

OR

Que.5 Answer the following questions.

- (A) What is hyperconjugation? Explain with suitable example.
- (B) Explain Importance and application of Colloids.

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