

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

January-2024

Introductory Chemistry (Major-2)

Time: 2:00 Hours

Marks: 50

Instructions:

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

- Que.1 (A) Answer the following question.
- (1) Differentiate Inter and intra molecular H-bond. (02)
 - (2) Explain sp^2 hybridization with example. (03)

- (B) Answer the following question.
- (1) Draw energy level diagram of N_2 molecule and calculate its bond order and magnetic moment. (05)

OR

- Que.1 (A) Answer the following question.
- (1) Write any two differences between BMO and ABMO. (03)
 - (2) Explain sp^3 hybridization with example. (02)

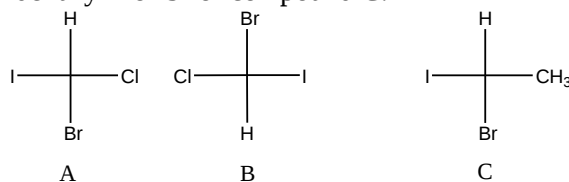
- (B) Answer the following question.
- (1) Discuss VSEPR theory in details. (05)

- Que.2 (A) Answer the following question.
- (1) Write any two differences between configurational isomer and conformational isomer. (02)
 - (2) Define; Configuration, Enantiomers and Diastereomers. (03)

- (B) Answer the following question.
- (1) Discuss order, mechanism, stereochemistry and relative reactivity for SN^1 reaction mechanism giving suitable example. (05)

OR

- Que.2 (A) Answer the following question.
- (i) Identify the stereochemical relationship (Homomer/Enantiomers/Diastereomers) between A and B. (01)
 - (ii) Identify R or S for compound C. (01)



- (2) Write any three differences between enantiomers and diastereomers. (03)

- (B) Answer the following question.
- (1) Discuss order, mechanism, stereochemistry and relative reactivity for SN^2 reaction mechanism giving suitable example. (05)

- Que.3 (A) Answer the following question.
- (1) Define; Lyophilic colloids and Lyophobic colloids. (02)
 - (2) Write short note on Dialysis. (03)

- (B) Answer the following question.
- (1) What is zeta potential? How does it explain the stability of colloidal particles. (05)

OR

- Que.3 (A) Answer the following question.
 (1) Explain Gold number. (02)
 (2) Write short note on Peptization. (03)

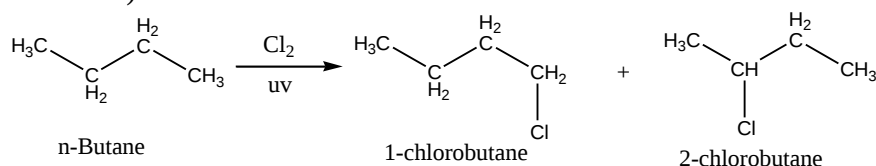
- (B) Answer the following question.
 (1) Discuss various application of colloids. (05)

- Que.4 (A) Answer the following question.
 (1) Calculate electron pair, bond pair and loan pair in I_3^- and SO_4^{2-} . (02)
 (2) Explain gerade and ungerade molecular orbital. (03)

- (B) Answer the following question.
 (1) Write only equation for nitration, sulphonation and halogenation substitution reaction of alkane. (05)

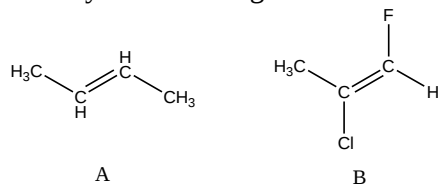
OR

- Que.4 (A) Answer the following question.
 (1) Explain Wurtz reaction. (02)
 (2) Calculate product composition for following reaction; (reactivity for $1^0 = 1$, $2^0 = 3.8$ and $3^0 = 5$). (03)



- (B) Answer the following question.
 (1) Draw energy level diagram of O_2 molecule and calculate its bond order and magnetic moment. (05)

- Que.5 (A) Answer the following question.
 (1) Identify the following isomer A and B as cis-trans / E-Z. (02)



- (2) Draw Fisher projection formula of erythrose and convert it into Sawhorse and Newmann. (03)

- (B) Answer the following question.
 (1) Discuss (i) Tyndall effect and (ii) Brownian movement (05)

OR

- Que.5 (A) Answer the following question.
 (1) Write any two differences between elastic and non-elastic gel. (02)
 (2) Explain Bredig's arc method. (03)

- (B) Answer the following question.
 (1) Define the following; Homomers, Constitutional isomer, Stereoisomers, Chirality and Geometrical isomers. (05)
