647510 **0301102C1010** **Seat No :_____**

B.Sc. Semester - 1 (*CBCS*) Examination
Nov/Dec - 2022 (OLD COURSE)
CHEMISTRY (CORE)

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

Instructions:

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

Q.1(A) Answer the following questions. **(4 Marks)**

1. State Hund's rule.
2. Which metal ion is present in chlorophyll?
3. Write definition of adsorbate.
4. Give definition of catenation?

Q.1(B) Answer any one out of two. **(2 Marks)**

1. Explain spin quantum number.
2. Explain properties of graphite.

Q.1(C) Answer any one out of two. **(3 Marks)**

1. Write a note on De-Broglie's equation.
2. Explain differences between chemical adsorption and physical adsorption.

Q.1(D) Answer any one out of two. **(5 Marks)**

1. Write a note on electro negativity.
2. Write a note on applications of adsorption.

Q.2 (A) Answer the following questions. **(4 Marks)**

1. Draw structure of ethane.
2. Give definition of SP hybridization.
3. Write electronic configuration of nitrogen atom.
4. Write electronic configuration of helium atom.

Q.2 (B) Answer any one out of two. **(2 Marks)**

1. Write a note on Anti bonding molecular orbital (ABMO).
2. Write a note on pi - bond.

Q.2 (C) Answer any one out of two. **(3 Marks)**

1. Explain sp^2 hybridization.
2. Explain valance bond theory.

Q.2(D) Answer any one out of two. **(5 Marks)**

1. Explain VSEPR theory
2. Draw the energy level diagram of B_2 molecule and calculate it's bond order.

Q.3(A) Answer the following questions. **(4 Marks)**

1. Give IUPAC name of $CH_3 - CH_2 - CH_3$.
2. Give IUPAC name of $CH_3 - OH$.
3. Define addition reaction.
4. Define heterolytic fission.

Q.3(B) Answer any one out of two. **(2 Marks)**

1. Give definitions of Nucleophiles and electrophiles.
2. Give definitions of homomers and enantiomers.

Q.3(C) Answer any one out of two. **(3 Marks)**

1. Explain SN^2 reaction.
2. Write a note on inductive effect.

Q.3(D) Answer any one out of two. **(5 Marks)**

1. Explain SN^1 reaction with mechanism and examples.
2. Write a note on Carbanion.

Q.4(A) Answer the following questions. **(4 Marks)**

1. Define alkane.
2. Define E1 reaction.
3. Define sorption.
4. What is enzyme catalyst ?

Q.4(B) Answer any one out of two. **(2 Marks)**

1. Explain Markownikov's rule.
2. Write a note on autocatalysis..

Q.4(C) Answer any one out of two. **(3 Marks)**

1. Explain Anti - markovnikov's rule with example.
2. Explain role of promotes and inhibitors in catalysis.

Q.4(D) Answer any one out of two. **(5 Marks)**

1. Explain E1cb reaction with mechanism.
2. Write a note on adsorption theory of catalysis.

Q.5(A) Answer the following questions. **(4 Marks)**

1. Write definition of order of reaction?
2. Define - Rate of reaction?
3. What is zero order reaction ?
4. What is Molecularity of the reaction?

Q.5(B) Answer any one out of two. **(2 Marks)**

1. Give characteristics of zero order reaction.
2. Write a note on limitations of collision theory.

Q.5(C) Answer any one out of two. **(3 Marks)**

1. Write a note on factors affecting on rate of reaction.
2. Explain graphical method for the determination of rate of reaction.

Q.5(D) Answer any one out of two. **(5 Marks)**

1. Write a note on Arrhenius equation.
2. Discuss van't Hoff differential method for the determination of order of reaction.

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