

B.Sc. Semester - 1 (CBCS) Examination
Nov./Dec. -2018 (Old Course)
CHEMISTRY (CORE)

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

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que-1 (A) Answer the following question in short. (04)
- (1) Define: Atomic radii.
 - (2) Define: Electronegativity.
 - (3) Give statement of Hund's rule.
 - (4) Give any two factors which affect adsorption.
- (B) Answer any one question out of two. (02)
- (1) Explain: Principal Quantum no. n .
 - (2) Discuss the periodic trend of atomic radii.
- (C) Answer any one question out of two. (03)
- (1) Explain: Pauli's Exclusion principle.
 - (2) Differentiate adsorption and absorption.
- (D) Answer any one question out of two. (05)
- (1) Discuss diagonal relationship between Li and Mg.
 - (2) Define adsorption and give the applications of adsorption.
- Que-2 (A) Answer the following question in short. (04)
- (1) Define: Bond length.
 - (2) Give equation to calculate magnetic momentum.
 - (3) Give shape and hybridization of PCl_5 .
 - (4) Define: sp^2 hybridization.
- (B) Answer any one question out of two. (02)
- (1) Give MO electron configuration of B_2 , with its bond order.
 - (2) Explain structure of SiH_4 .
- (C) Answer any one question out of two. (03)
- (1) Difference between BMO and ABMO.
 - (2) Comparison of MO and VB theory.
- (D) Answer any one question out of two. (05)
- (1) What is hybridization? Discuss sp^3d^2 hybridization with suitable example.
 - (2) Discuss the bond order, stability and magnetic properties using MO energy level Diagram of O_2 molecule.
- Que-3 (A) Answer the following question in short. (04)
- (1) Give IUPAC name of $\text{C}(\text{CH}_3)_4$.
 - (2) Write the structural formula for 3-ethyl-2-methyl heptane.
 - (3) Define: Electrophile.
 - (4) State different types of organic reactions.
- (B) Answer any one question out of two. (02)
- (1) Discuss homolytic and heterolytic fission with example.
 - (2) Explain: Rearrangement reaction with examples.
- (C) Answer any one question out of two. (03)
- (1) Discuss Geometrical isomerism.
 - (2) Define: Addition reaction with examples.

- (D) Answer any one question out of two. (05)
- (1) Explain CIP (Cahn-Ingold-Prelog) rules.
 - (2) What is inductive effect? Give applications of inductive effect.
- Que-4 (A) Answer the following question in short. (04)
- (1) Define: Halogenation reaction.
 - (2) Define: catalyst?
 - (3) Explain: Hofmann rule.
 - (4) Give alkyne react with HCN reaction.
- (B) Answer any one question out of two. (02)
- (1) Explain dehydrohalogenation of vicinal dihalides.
 - (2) What is enzyme catalyst? Give its uses.
- (C) Answer any one question out of two. (03)
- (1) Explain Markovnikovs rule with examples.
 - (2) Write any three uses of catalyst.
- (D) Answer any one question out of two. (05)
- (1) Explain E^1 and E^2 reaction with mechanisms.
 - (2) (a) Explain: Acid-Base catalyst.
(b) Explain: Ozonolysis reaction of alkene.
- Que-5 (A) Answer the following question in short. (04)
- (1) What is order of reaction?
 - (2) Give one example of first order reaction.
 - (3) Define: Energy of activation.
 - (4) Give the formula of half life time for second order reaction.
- (B) Answer any one question out of two. (02)
- (1) Write note on: Pseudo first order reaction.
 - (2) Give the reason for failure of collision theory.
- (C) Answer any one question out of two. (03)
- (1) Decomposition of a gas is of second order. It takes 40 minutes for 40% of a gas to be decomposed when its initial concentration is 4×10^2 mole/lit. Calculate the specific reaction rate for a second order reaction.
 - (2) Explain zero order reaction with examples.
- (D) Answer any one question out of two. (05)
- (1) Derive Equation of rate constant for second order reaction and mention its Characteristics.
(When $a=b$)
 - (2) Describe any two methods used to determine the order of reaction.
