

**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: Electro negativity.
  - (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  $\text{PCl}_5$ .
  - (4) Define:  $sp^2$  hybridization.
- (B) Answer any one question out of two. (02)
- (1) Give MO electron configuration of  $\text{B}_2$ , with its bond order.
  - (2) Explain structure of  $\text{SiH}_4$ .
- (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  $\text{O}_2$  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 *s*-methyl heptanes.
  - (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 Markovnikov's 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  $4 \times 10^2$  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.

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