

B.Sc. Semester - 1 (CBCS) Examination
Jan/Feb.-2022 (OLD COURSE)
CHEMISTRY (CORE)

Time: 1:30 Hours**Marks: 42****Instructions:**

1. Figures to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any three of the following questions.
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- Q. 1 (a) Answer the following question. (4)
- (1) State 'Heisenberg's uncertainty principle'.
 - (2) Give the name of allotrope of carbon.
 - (3) Define catenation.
 - (4) Which force is responsible for physical adsorption?
- (b) Answer any one question (2)
- (1) Why the electron affinity of chlorine is higher than fluorine?
 - (2) State the factor responsible for anomalous behavior of elements?
- (c) Answer any one question (3)
- (1) Give difference between Chemical adsorption and Physical adsorption.
 - (2) Discuss structure graphite.
- (d) Answer any one question (5)
- (1) Explain Inert pair effect.
 - (2) Discuss the factor affecting on adsorption and its characteristic.
- Q. 2 (a) Answer the following question. (4)
- (1) Define ionic bond
 - (2) Give shape and bond angle of BF_3
 - (3) Define bond length.
 - (4) Draw the structure showing hybridization in SnCl_2 .
- (b) Answer any one question (2)
- (1) Explain bond angle in H_2O is smaller than NH_3 .
 - (2) Give differences between BMO and ABMO
- (c) Answer any one question (3)
- (1) What is hybridization? Explain sp hybridization.
 - (2) Explain sigma and pi molecular orbitals.
- (d) Answer any one question (5)
- (1) Draw the energy level diagram of N_2 molecule and calculate bond order, Bond length and magnetic property.
 - (2) Explain VSEPR theory.
- Q. 3 (a) Answer the following question. (4)
- (1) Define Isomerism.
 - (2) Define electromeric effect.
 - (3) Write alkyl halides in decreasing order of their bond length.
 - (4) Write four functional groups which shows -M effect.
- (b) Answer any one question (2)
- (1) Discuss inductive effect with suitable example.
 - (2) What is rearrangement reaction? Give an example.
- (c) Answer any one question (3)
- (1) Discuss hyperconjugation effect with suitable example.
 - (2) Give three preparation of (i) Carbocations (ii) carbene (iii) benzyne.

- (d) Answer any one question (5)
- (1) Explain SN^2 reaction in detail.
 - (2) Explain acidity of aliphatic carboxylic acids.
- Q. 4 (a) Answer the following question. (4)
- (1) What are general formula of alkynes?
 - (2) Give anti Markownikov's rule.
 - (3) Give the statements of saytzeff rule?
 - (4) State activation energy.
- (b) Answer any one question (2)
- (1) Explain Syn and anti- hydroxylation (Oxidation) of alkene
 - (2) What is function of catalytic promoters and inhibitors in chemical reactions?
- (c) Answer any one question (3)
- (1) Explain Hofmann elimination rule for alkene.
 - (2) Describe nucleophilic addition reaction of alkynes.
- (d) Answer any one question (5)
- (1) Give difference between E1 and E2 reaction.
 - (2) Discuss the theory of heterogeneous catalysis and illustrate with examples.
- Q. 5 (a) Answer the following question. (4)
- (1) Give equation of half-life period of zero order reaction?
 - (2) Define: order of chemical reaction.
 - (3) Define: specific rate constant
 - (4) Give two example of second order reaction.
- (b) Answer any one question (2)
- (1) Derive following equation for first order reaction $t_{1/2} = \frac{0.693}{k}$
 - (2) Give characteristic of second order reaction.
- (c) Answer any one question (3)
- (1) Explain: Van't Hoff differential method for determination of order of reaction.
 - (2) Give the Difference between Order of reaction and Molecularity
- (d) Answer any one question (5)
- (1) Explain the factors affecting on rate of chemical reaction.
 - (2) Write the short note on collision theory of reaction rate.
