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

B.Sc. Semester - 1 (*CBCS*) Examination
Oct/Nov. -2019 (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 question. **(4)**

(1) Which elements have maximum electronegativity in the periodic table?

(2) Give the name of allotrope of carbon.

(3) Define Polarizing power.

(4) Which force is responsible for physical adsorption?

(b) Answer any one question. **(2)**

(1) Why the ionization energy of Be is greater than Li? Give reason.

(2) Explain diagonal relationship.

(c) Answer any one question. **(3)**

(1) Give difference between Chemical adsorption and Physical adsorption.

(2) The internuclear distance of NaF is 2.31A^{o} and the screening constant is 4.5. calculate r^{+} (Na^{+}) and r^{-} (F^{-}) using Pauling's method. (Atomic number of Na =11 and F =9).

(d) Answer any one question **(5)**

(1) Explain Inertpair effect.

(2) Derive Freundlich Equation and it's limitation.

Q. 2 (a)Answer the following question. **(4)**

(1) Define Covalent bond

(2) Give shape and bond angle of BF_3

(3) Draw the structure showing hybridization n SO_4^{-2}.

(4) Give electronic configuration according to MO theory of N_2.

(b) Answer any one question. **(2)**

(1) Explain CO_2 molecule is linear in shape and SO_2 molecule is angular

(2) Give Limitation of valence bond theory.

(c) Answer any one question. **(3)**

(1) Give differences between BMO and ABMO

(2) Explain sigma and pi molecular orbitals.

(d) Answerany one question. **(5)**

(1) Draw the energy level diagram of NO molecule and calculate bond order, Bond length and magnetic property.

(2) Explain **sp** hybridization and **sp^2** hybridization with examples

Q. 3 (a)Answer the following questions. **(4)**

(1) Write four functional groups which shows +M effect.

(2) Explain Ambident nucleophile.

(3) Write alkyle halides in decreasing order of their bond length.

(4) Define geometrical isomers.

(b) Answer any one question. **(2)**

(1) Explain reactivity of 1^0, 2^0, 3^0 alkyle halide using inductive effect.

(2) Explain structure of free radical.

(c) Answer any one question. **(3)**

(1) Discuss Mesomeric effect with suitable example.

(2) Give three preparation of (i) Carbocations (ii) carbine (iii) benzyne.

(d) Answer any one question. **(5)**

(1) Explain SN^1 reaction in detail.

(2) Discuss stability of carbocation in details.

Q. 4 (a) Answer the following questions. **(4)**

(1) What is organic chemistry?

(2) Give Markownikovs's rule.

(3) Define: Autocatlyst

(4) Give only name of elimination reaction according to mechanism

(b) Answer any one question. **(2)**

(1) Give Wurtz-Fitting reaction for alkane synthesis.

(2) What is function of catalytic promoters and inhibitors in chemical reactions?

(c) Answer any one question. **(3)**

(1)Explain Syn and anti- hydroxylation (Oxidation) of alkene.

(2) Describe nucleophilic addition reaction of alkynes.

(d) Answer any one question. **(5)**

(1) Give difference between E1 and E2 reaction.

(2) Discuss Enzyme catalyst in detail.

Q. 5 (a) Answer the following question. **(4)**

(1) Give unit of rate constant for second order reaction.

(2) Define: Rate law.

(3) Give any two examples of zero order reaction.

(4)Define: Activation energy.

(b) Answer any one question. **(2)**

(1) Derive following equation for first order reaction $t_{1/2}=\frac{0.693}{k}$

(2) The rate constant for a reaction of zero order in A is 0.0030 mol $L^{-1}s^{-1}$. How long will it take for the initial concentration of A to fall from 0.10 M to 0.075 M

(c) Answer any one question. **(3)**

(1) Give the Difference between Order of reaction and Molecularity

(2)Explain: Ostwald isolation method for determination of order of reaction.

(d) Answer any one question. **(5)**

(1) Give characteristics of second order reaction

(2) Explain: Influence of temperature on reaction rates or Arrhenius equation

****