B. Sc. (Sem. I) (CBCS) (W.E.F. 2016) Examination

December - 2019

C - 101 : Chemistry

Faculty Code : 003
Subject Code : 0011003

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instructions : (1)   All questions are compulsory.

(2)   Marks are indicated on right side.

1   (A)   Answer the following Questions : (Each have one mark)   4

(1)   In $5S^2$ What is n,l,m ?

(2)   In Halogen Group Which Element Have Highest Electronagativity ?

(3)   In Diamond _____ is Hybridization?

(4)   Charcoal used as decolouriser is _____ phenomenon.

(B)   Answer in brief : (Any **One** out of Two)   2

(1)   What is electro affinity ? Give its general trend in periodic table.

(2)   Give diagonal relationship of lithium with magnesium. (any two point)

(C)   Answer in detail : (Any **One** out of Two)   3

(1)   Explain Freundlich Adsorption isotherm.

(2)   Explain Heisenberg's Uncertainty.

(D) Write a note on : (Any **One** out of Two)   **5**

(1) Langmuir theory of Adsorption.

(2) Quantum numbers in detail.

2 (A) Answer the following Questions : (Each have one mark)   **4**

(1) In $BeCl_2$ _____ Hybridization.

(2) Give one example of SP^3 Hybridization.

(3) Give structure of SO_4^{-2}.

(4) Give Bond order of nitrogen molecule.

(B) Answer in brief : (Any **One** out of Two)   **2**

(1) Define sp^3d Hybridization with example.

(2) In BF_3 and SF_6 Explain with Hybridization.

(C) Answer in detail : (Any **One** out of Two)   **3**

(1) Explain σ, π and $\sigma*, \pi*$.

(2) Draw Energy level diagram of Boron molecule.

(D) Write a note on : (Any **One** out of Two)   **5**

(1) Draw Energy level diagram of O_2 and discuss stability of $O_2^{-1}, O_2^{-2}, O_2, O_2^{+1}, O_2^{+2}$.

(2) Draw Energy level diagram of CO. with mixing and orbital interaction).

3 (A) Answer the following Questions : (Each have one mark) **4**

(1) Define term Carbocation.

(2) Define Homolytic and hetrolytic fission.

(3) $C(CH_3)_4$ Give IUPAC Name. = 2,2

(4) CH_3COOH and $ClCH_2COOH$ Which is more acidic ?

(B) Answer in brief : (Any **One** out of Two)   2

    (1) Explain Elecrophilic Reagent with example.

    (2) Define Addition reaction with examples.

(C) Answer in detail : (Any **One** out of Two)   3

    (1) Write the structural formula for

        (1) 3-chloro-2methyl hexane. (2) 2,2,3-try methyl butane (3) 1,4-dibromo-2-methyl butane.

    (2) Explain Application of Inductive effect to relative strength of acid.

(D) Write a note on : (Any **One** out of Two)   5

    (1) Explain SN^1 and SN^2 reaction.

    (2) Explain Cahn-Ingold-Prelog Rule (CIP) / rules for R and S configuration.

4   (A) Answer the following Questions : (Each have one mark)   4

    (1) Define Markovnikov's rule.

    (2) Define Vicinal dihalide.

    (3) Give one example of homogeneous catalyst.

    (4) What is Promotors.

   (B) Answer in brief : (Any **One** out of Two)   2

    (1) Explain Saytzeff's rule with examples.

    (2) Explain Hofmann's rule with examples.

   (C) Answer in detail : (Any **One** out of Two)   3

    (1) Explain Diels-Alder Reaction.

    (2) Write any three uses of catalyst.

(D) Write a note on : (Any **One** out of Two)   5

    (1) Explain E^2 reaction with mechanism.

    (2) (a) Define Inhibitors and Catalytic poison.   2

        (b) Acid-base catalyst and Enzyme catalyst.   3

5 (A) Answer the following Questions : (Each have one mark) 4

    (1) What is Molecularity of Reaction ?

    (2) Give example of Zero order reaction.

    (3) What is unit of velocity constant (K) for first order reaction ?

    (4) Give the formula of $t_{1/2}$ for second order reaction.

(B) Answer in brief : (Any **One** out of Two)   2

    (1) Explain Zero Order Reaction.

    (2) Calculate the activation energy of a reaction whose reaction at 27°C gets doubled for 10°C rise in temperature.

(C) Answer in detail : (Any **One** out of Two)   3

    (1) Write a note on Pseudo first order reaction.

    (2) A First order reaction is 40% complete in 50 min. Calculate value of rate constant. In what time will the reaction be 80% omplate ?

(D) Write a note on : (Any **One** out of Two)   5

    (1) Derive Equation of rate constant for second order reaction and mention its characteristics (when a=b).

    (2) Discuss the third order reaction in detail.