



BB-003-2011004

Seat No. _____

B. Sc. (Sem. I) (CBCS) Examination

March - 2021

C - 101 : Chemistry Theory

(New Course)

Faculty Code : 003

Subject Code : 2011004

Time : $2\frac{1}{2}$ Hours]

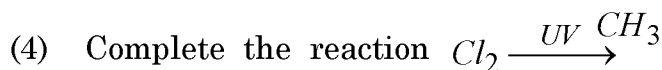
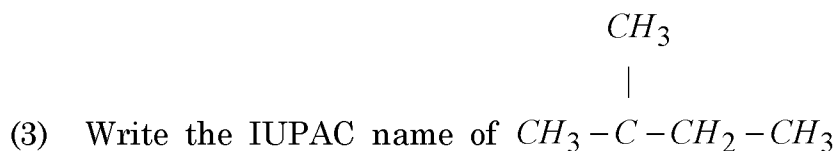
[Total Marks : 70

- Instructions :** (1) Answer any five questions.
(2) All questions carry 14 marks.
(3) Figures to the right indicate marks.

- 1 (a) Answer the following questions : 4
(1) Write the stable electronic configuration of Cr.
(2) Orbital angular momentum quantum number is also known as _____.
(3) Complete the reaction
 $\text{SiO}_2 + \text{NaOH} \rightarrow$
(4) The process of removal of an absorbed substance from which it is absorbed is called _____.
- (b) Explain Fujan's first rule about the polarizing power. 2
- (c) State the difference between chemical absorption and physical absorption. 3
- (d) Discuss the diagonal relationship of Li with Mg. 5
- 2 (a) Answer the following questions : 4
(1) State De-Broglies equation.
(2) Diamonds has _____ dimensional lattice.
(3) State the principle of Heisenberg mathematically.
(4) Define Covalent radius.

- (b) State the limitations on Freundlich adsorption isotherm. **2**
- (c) Explain : Adsorption, Adsorbent and Adsorbate. **3**
- (d) Discuss the factors affecting the magnitude of electronegativity. **5**
- 3** (a) Answer the following questions : **4**
- (1) How many equivalent hybrid orbitals in SiH_4 .
 - (2) Which type of hybridization present in $SnCl_2$ molecule ?
 - (3) Write the electronic configuration of carbon in excited state.
 - (4) Write the bond angle of $F-C-F$ in F_2CO .
- (b) Explain π and π^* M.O. **2**
- (c) Write the limitations of V.B. Theory. **3**
- (d) Discuss about molecules orbital formation in hetero diatomic AB type molecule with example. **5**
- 4** (a) Answer the following questions : **4**
- (1) Write the full form of VSEPR.
 - (2) Molecular structure (shape) of SO_4^{2-} is _____.
 - (3) Ionic, covalent and metallic bonds are quite strong is also termed as _____.
 - (4) What is order of the bond in N_2 ?
- (b) Explain SP^2 hybridisation with suitable example. **2**
- (c) Write the differences between BMO and ABMO. **3**
- (d) What is hybridization ? Explain SP^3d hybridisation in PCl_5 . **5**

- 5 (a) Answer the following questions : 4
 (1) Define Carbenes.
 (2) Write the full form of IUPAC.



- (b) Name the types of organic reactions. 2
- (c) Write the short note : Fisher Projection Formula. 3
- (d) Explain rules for assigning R and S configuration. 5
- 6 (a) Answer the following questions. 4
 (1) Define : Isomerism.
 (2) Write the structural formula of *p*-Aniside
 (3) Define : Carbanion.
 (4) What is the charge on carbon free radical.
- (b) Explain Homolytic fission. 2
- (c) Explain conditions for geometrical isomerism. 3
- (d) What is nucleophilic substitution reaction ?
 Explain SN² reaction mechanism. 5
- 7 (a) Answer the following questions : 4
 (1) The first member of alkyne series is _____.
 (2) Dehydration of alcohol gives _____.
 (3) How many hydrogens on adjacent carbon atom in Vic. dihalides ?
 (4) Ethylene reacts with nitroschloride gives _____.
- (b) Explain dehydrohalogenation of alkylhalide with suitable example. 2
- (c) Write short note : Markovnikov's rule. 3
- (d) Explain E' reaction with mechanism. 5

- 8 (a) Answer the following questions : 4
- (1) Write the general formula of alkenes.
 - (2) Reduction of ethylene gives _____.
 - (3) Complete the reaction :

$$\text{CaC}_2 + \text{H}_2\text{O}$$
 - (4) Write the equation for combustion of ethylene.
- (b) Explain hydroboration of Acetylene. 2
- (c) Explain Diels-Alder reaction. 3
- (d) Explain Oxymercuration – Demercuration reaction. 5
- 9 (a) Answer the following questions. 4
- (1) Write the main types of catalysts.
 - (2) Write the reaction for brommation of aceton.
 - (3) Define : Chemical kinetics.
 - (4) What is unit of second order reaction ?
- (b) Write the limitations of collision theory. 2
- (c) Explain : Catalysis. 3
- (d) Which are the different methods to determine order of the reaction ? Discuss any two. 5
- 10 (a) Answer the following questions : 4
- (1) Complete the reaction :

$$\text{H}_2 + \text{Cl}_2 \xrightarrow{h\nu}$$
 - (2) Define : First order reaction.
 - (3) What is negative catalyst ?
 - (4) In manufacture of ammonia by Hober's process CO acts as _____ catalyst.
- (b) Explain : Order of a reaction. 2
- (c) Short note : Auto catalyst. 3
- (d) What is enzyme catalysis ? Explain characteristics of enzyme catalysts. 5