

C35] Seat No. —

No. of printed pages : 03

SARDAR PATEL UNIVERSITY

B.Sc. (Second Semester Examination) (NC)

Thursday, 20th October 2016.

02:00 p.m. to 04:00 p.m.

USO2CCHE01 – ORGAIC CHEMISTRY

Total Marks : 70

Note: (i) All questions are to be attempted. (ii) Figures to the right indicate marks.

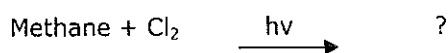
Q.1 Choose the correct option for the following : [10]

- The general formula of Grignard reagent is
(a) Mgx (b) $RMgLi$
(c) $RMgx$ (d) R_2CuLi
- free radical is less stable.
(a) 1^\bullet (b) 2^\bullet
(c) 3^\bullet (d) CH_3^\bullet
- Cyclobutane on catalytic hydrogenation at $200^\circ C$ to give.....
(a) n - Butane (b) 1 - Butene
(c) 2 - Butene (d) None of these
- E2 reaction is a step reaction.
(a) two (b) single
(c) three (d) zero
- Which of the following reagent is suitable for anti-hydroxylation of cycloalkane ?
(a) Hot $KMnO_4$ (b) Cold alkaline $KMnO_4$
(c) HCO_2OH (d) dil. $KMnO_4$
- Lithium acetylide is treated with n-Butyl bromide gives?
(a) 1 - Hexyne (b) 2 - Hexyne
(c) 1 - Hexene (d) 2 - Hexene
- Which type of hybridization is present for halogenated carbon atom of aryl and vinyl halides ?
(a) SP (b) SP^2
(c) SP^3 (d) SP^2d^2
- S_N2 reaction follows order kinetics.
(a) Zero (b) First
(c) Second (d) None of these
- Which of the following is meta directing group ?
(a) $-C_6H_5$ (b) $-OH$
(c) $-Cl$ (d) $-COOH$
- catalyst is use in Friedel - Craft alkylation of benzene.
(a) $FeCl_3$ (b) $R-X$
(c) $Conc.H_2SO_4$ (d) $AlCl_3$

Q.2 Answer the following : [Attempt any ten] : [20]

1. Define : (a) Free radical (b) Angle Strain.
2. Write the synthesis of n-Nonane from methyl bromide by using Corey – House reaction.
3. Chlorination of n – propane yield 1 – chloropropane and 2 – chloropropane in 44 % and 56 % respectively. Find out relative reactivity for concerned hydrogen.
4. Do as directed : 2 – pentene react with O₃ followed by H₂O/Zn.
5. Write the synthesis of 1 – butyne from acetylene.
6. Difference between : E1 and E2 reaction.
7. Explain. Hydrolysis of p-Nitroacetanilide is best carried out in acidic solution.
8. Explain the term "Benzyne".
9. Difference between : Electrophile and Nucleophile.
10. Give the limitation of Friedel – Craft alkylation.
11. Do as directed : Benzene undergo nitration followed by bromination in presence of FeBr₃.
12. Classify the following group into an activating and deactivating group.
- C₂H₅, - CN, - CHO, - NH₂, - NHCOCH₃, - SO₃H

Q.3(a) Complete the following reaction and give detail stepwise mechanism for it. [04]



- (b) Calculate the percentage of isomeric products obtained upon monochlorination of Isobutane. The relative reactivity of 1°, 2° and 3° hydrogens are 1:3.8:5 respectively. [03]

(c) **Write the structural formula for the following :** [03]

- (i) Tricyclo [3.1.1.0^{3,7}] heptane
- (ii) Bicyclo [1.1.1] pentane
- (iii) Isopropylcyclohexane

OR

Q.3(a) Arrange the following molecules in the increasing order of stability according to Baeyer's angle strain theory and explain your answer. [04]

- (i) Cyclohexane
- (ii) Cyclopropane
- (iii) Cyclopentane

(b) **Do as directed.** [03]

- (i) Ethylbromide on reduction with Zn-metal in presence of acid.
- (ii) Sec-butylmagnesiumbromide on hydrolysis.
- (iii) Cyclopropane on chlorination in presence of light

(c) **The names given below are objectionable give their structure and correct IUPAC name for the following.** [03]

- (i) 3 – Ethyl-1 – methyl cyclohexane
- (ii) 1 – Cyclohexen – 3 – ol
- (iii) 1,5 – Dimethyl cyclohexane

- Q.4(a)** Give stepwise detail reaction mechanism for dimerization of Isobutylene. [04]
- (b)** Differentiate Oxymercuration – Demercuration reaction and Hydroboration – Oxidation reaction with suitable illustration. [03]
- (c)** Explain. 1 – Butyne gives red ppts. with Fehling solution but 2 – Butyne does not. [03]

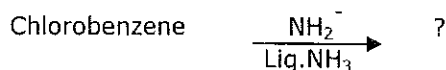
OR

- Q.4(a)** Define "Heat of hydrogenation". Explain. trans – 2 – butene is more stable than cis – 2 – butene. [04]
- (b)** Write a short note : keto – enol tautomerism. [03]
- (c)** Complete the following reaction and give details mechanism for it. [03]
propylene + HCl \longrightarrow ?

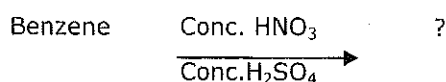
- Q.5** Write S_N1 reaction mechanism with kinetics. [10]
Write all the possible isomeric structural formula and IUPAC name for the compound having molecular formula C_4H_9Br . Classify them as 1° , 2° and 3° alkylhalides.

OR

- Q.5** Write a short note on Frank Whitmore rearrangement. Also give the basic difference between Homolytic and Heterolytic cleavage. Complete the following reaction and give detail stepwise mechanism for it. [10]



- Q.6 (a)** Complete the following reaction and give details stepwise mechanism for it. [04]



- (b)** Give synthesis of Benzotrichloride from Benzene. [03]
- (c)** Draw the structure formula and name for the following aromatic compound. [03]

(i) C_8H_6 (ii) $C_{13}H_{12}$ (iii) C_7H_8

OR

- Q.6(a)** Give detail stepwise reaction mechanism for chlorination of Benzene. [04]
- (b)** Describe Huckel ($4n+2$) rule with suitable examples. [03]
- (c)** Give the structural formula and IUPAC name for the following. [03]
(i) Mesitylene (ii) Styrene (iii) Benzylalcohol.

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