SC

(100) SEAT No. ____

No of Printed Pages: 04

SARDAR PATEL UNIVERSITY

M.Sc. (CHEMISTRY) Semester –II, Examination

October 24, 2018 Wednesday

ORGANIC CHEMISTRY–II [PS02CCHE02]

Time: 10:00 A. M. - 01:00 P. M. **Maximum Marks – 70**

Q.1 Select the correct answer from the option given below for each of the following questions. Write **ONLY ANSWERS** in the provided answer book. **[e.g. Q.1 (1)-(a)]** **[08]**

(1) γ-hydroxy ketones upon reaction with DCC gives _____.

(a) Cyclopropyl ketone (b) β-lactum

(c) γ-latone (d) Aceylperoxide

(2) Which of the following statements are correct for the Shapiro reaction?

(i) It employs strong base. (ii) High substituted alkene is generated.

(iii) It is solvent dependent. (iv) Two moles of base is used.

Option: (a) 1 & 2 are correct. (b) 1, 2 & 4 are correct.

(c) 1, 3 & 4 are correct. (d) 1 & 4 are correct.

(3) _____ is a selective epoxidation agent for –C=C- conjugated with a carbonyl function.

(a) Lead tetraacetate (b) Alkaline hydrogen peroxide

(c) Manganese dioxide (d) Mercuric oxide

(4) Reaction of acetone with $LiAlH_4$ gives _____.

(a) 2-propanol (b) Propanoic acid

(c) 1-propanal (d) 1-propanol

(5) Which of the following is the correct pair of substrate to get ethyl vinyl ketone using Mannich reaction in presence of secondary amine?

(a) Formaldehyde + 2-butanone (b) Formaldehyde + acetone

(c) Formaldehyde + 2-pentanone (d) Formaldehyde + 3-pentanone

(6) _____ is the silicon analogous of Wittig reaction.

(a) Schlosser modification (b) Horner Emmons reaction

(c) Peterson olefination (d) Arbuzov reaction

(7) Lithium diisopropylamide (LDA) _____.

(a) contains a $CO\text{-}NH_2$ group (b) can be use to deprotonate butanone

(c) is formed by reacting an amide with BuLi (d) is a good nucleophile

(P.T.O)

(8) Which of the following conversion can be carried out by Clemmensen reduction?

(i) Benzaldehyde into benzyl alcohol (ii) Cyclohexanone into cyclohexane

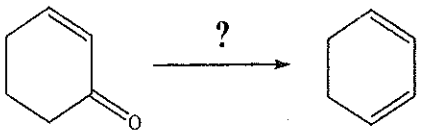
(iii) Benzyl chloride into benzaldehyde (iv) Benzophenone into diphenylmethane

Option: (a) i & ii (b) ii & iii

(c) ii & iv (d) iii & iv

Q.2 Answer **ANY SEVEN** of the following **[14]**

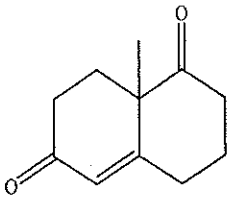
1. Explain: Stork enamine reaction is regioselective reaction.
2. Justify: "Use of hindered boron reagent is advantageous over the BH_3"
3. Write a short note on: Kornblum oxidation.
4. What is green chemistry?
5. Give the advantages of Horner Emmons reaction over Wittig reaction.
6. Explain the following conversion using Shapiro reaction.



7. Give the mechanism for the oxidation of toluene by alkaline $KMnO_4$.
8. Discuss the mechanism of reduction of propanoic acid by $LiAlH_4$.
9. Give the synthesis of two monofunctional hydroborating reagent.

Q.3

(a) Synthesize but-3-en-2-one using Mannich reaction. Use it in Robinson ring annulations reaction to synthesize following compound. **[06]**



(b) Answer the followings as directed: **[06]**

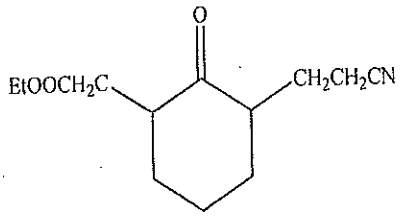
1. Explain: Wittig reaction with stabilized ylied, the ration of E/Z alkene in the product mixture is governed by decomposition rate of betain intermediate.

2. Describe the role of DCC in the synthesis of the following compounds:

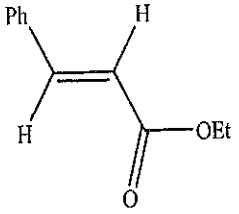
i) Amide formation ii) Aldehyde formation

OR

(b) Give the synthesis of the following compounds by the reaction mentioned against them. **[06]**



Stork Enamine Reaction



Horner Emmons Reaction

Q.4

(a) **Answer the followings:** **[06]**

1. Write a short note on: Bamford stevens reaction
2. Shows that Peterson olefination follows anti elimination under acidic condition.

(b) **Answer the followings:** **[06]**

1. What is the difference between migratory aptitudes in the intermediates of Bayer Villiger reaction and hydroboration reaction?
2. Shows that carbonylation of organoborane compounds is an excellent synthetic tool for the preparation of variety of organic compound.

OR

(b) **Complete the following reaction and explain their mechanism:** **[06]**

1. Acetaldehyde $\xrightarrow[\text{3. } CH_3CN \\ \text{4. } HgCl_2/H_2O]{\text{1. propane-1,3-dithiol} \\ \text{2. n-BuLi}}$?

2. Formaldehyde $\xrightarrow[\text{3. I-}CH_2\text{-}CH_2\text{-}CH_2\text{-Br}]{\text{1. propane-1,3-dithiol} \\ \text{2. n-BuLi}}$? $\xrightarrow{\text{n-BuLi}}$? $\xrightarrow{HgCl_2/H_2O}$?

(P.T.O)

Q.5

(a) **Answer the followings:** [06]

1. Explain the mechanism of Woodworth hydroxylation by citing the example of cis-2-butene.
2. The malaprade oxidation of one mole of polyhydroxy compound consumes three mole of the reagent to give two mole of formic acid and two mole of glyoxilic acid. Suggest the probable structure of the compound.

(b) **Explain the followings:** [06]

1. Mechanism of alkene reduction using Wilkinson catalyst.
2. Conversion of 1,1-dimethyltetraline to 1,2-dimethylnaphthailine using DDQ.

OR

(b) **Explain the followings:** [06]

1. Role of $Pb(OAc)_4$ in the formation of following compounds:
   i) Oxidation of 1,4-dibasic acid ii) Formation of medium size ring
2. Basic difference between the reactivity of Gilman and Grignard reagent towards α,β-unsaturated aldehyde with suitable example.

Q.6

(a) **Answer the followings:** [06]

1. Discuss the mechanism of Wolff kishner reduction.
2. Differentiate $LiAlH_4$ and $NaBH_4$ with respect to their reactivity by citing proper example.

(b) **Answer the followings:** [06]

1. What are the advantages of Phase Transfer Catalyst? Draw the structure of bicyclohexyl 18-crown-6 and give its IUPAC name.
2. Explain: The product formation of TBTH reduction of halogeno compounds depends on concentration of TBTH.

OR

(b) Write a short note on following name reactions: [06]

i) Meerwein Pondroff Verley reduction ii) Clemmenson reduction