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SEAT No._____ No of printed pages: 04

SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry) Semester-II Examination

Tuesday, 19th November 2019

Organic Chemistry-II (PS02CCHE22)

Time: 10.00 am to 1.00 pm **Total Marks: 70**

Note: Right hand figures indicate marks

Q. 1 : Select the correct answer from each of the following. **[08]**

1) β-amino carboxylic acid converted to β-lactum by using --------- .

a) DCC b) LDA c) R-Li d) DDQ

2) Which intermediate is formed in Bamford-Stevens reaction using protic solvent?

a) Carbocation b) Carbanion c) Carbene d) Nitrene

3) Which borane is formed by reaction of 2,3-dimethyl-2-butene and BH_3?

a) Catechol borane b) Thexyl borane c) Tripropyl borane d) Disiamyl borane

4) Selective alkylation of aldehydes and ketones can be carried out by using _____ reaction.

a) Wittig b) Stork-Enamine c) Robinson d) Mannich

5) Oxidation number of carbon-1 in acetic acid is_____ .

a) 0 b) 2 c) +3 d) -3

6) Which of the following functional group is not reduced by $NaBH_4$?

a) Aldehyde b) Ketone c) Ester d) Acid chloride

7) Active methylene group can be selectively oxidized by _____ .

a) SeO_2 b) DMSO/PTS c) MnO_2 d) $Al(O\text{-}terbutyl)_3$

8) Better alternative for Michael addition is _____.

a) Wittig reaction b) Robinson annulations c) Peterson reaction d) Shapiro reaction

Q. 2: Answer the following short questions (Any 7) **[14]**

1) How does Bamford-Stevens reaction is differ from Shapiro reaction?

2) Why Wittig reaction should be performed under inert and dry condition?

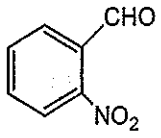
3) Why does enamine preparation required only 2^0 amine in Stork-Enamine reaction?

(P.T.O)

4) Explain the oxidation of benzylic alcohol using MnO_2 with mechanism.

5) Write the product of the following reactions.

i) $CH_3\text{-}C \equiv C\text{-}CH_3 \xrightarrow[H_2]{Pd/CaCO_3}$?

ii) 

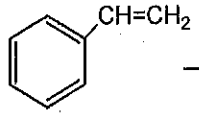
$\xrightarrow[i\text{-}PrOH]{Al(O\text{-}iPr)_3}$?

6) Give the synthesis of methyl vinyl ketone by using Mannich reaction.

7) What is the selectivity of $KMnO_4$ as reagent with varying conditions?

8) Discuss the mechanism of reduction of ethyl acetate by $LiAlH_4$.

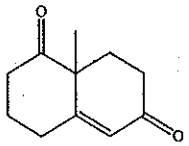
9) Complete the following reaction.



$\xrightarrow{9\text{-}BBN}$? $\xrightarrow{H_2O_2/^-OH}$?

Q. 3. A) Answer the following questions. **[06]**

i) Write the synthesis of following molecule by Robinson ring annulations.

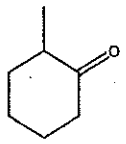


ii) Explain the Schlosser modification.

B) Do as directed. **[06]**

i) Non-stabilized ylide preferentially lead to the formation of Z-alkene in Wittig reaction. Explain.

ii) Complete the following transformation with detail mechanism.



$\xrightarrow[ii)\ 2MeLi]{i)\ TsNHNH_2}$?

OR

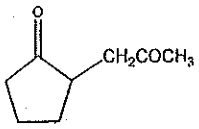
B) Answer the following questions. **[06]**

i) Show that Peterson olefination follows anti elimination under acidic condition.

ii) Nature of the solvent decides the pathway for Bamford-Stevens reaction.

Q.4. A) Answer the following questions. **[06]**

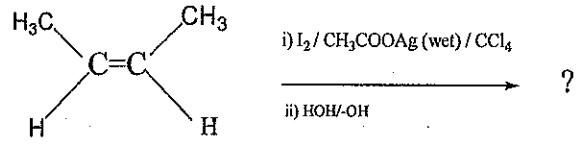
i) Write the synthesis of following molecule by Stork enamine reaction.



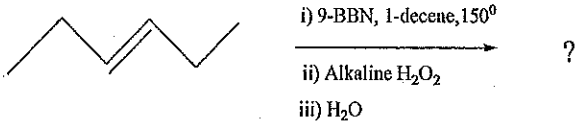
ii) Write a note on Bayer-Villliger oxidation.

B) Complete the following transformations. **[06]**

i)



ii)



OR

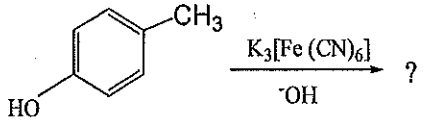
B) Answer the following questions. **[06]**

i) Give the detailed mechanism of Buchwald-Hartwig amination.

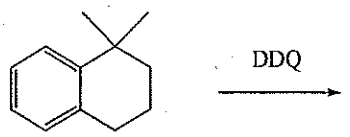
ii) Discuss the importance of carbonylation of organoborane compounds in organic synthesis.

Q.5. A) Complete the following transformations. **[06]**

i)



ii)



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B) Answer the following questions. **[06]**

i) Maleic acid on reaction with neutral $KMnO_4$ gives meso tartaric acid. Explain

ii) Discuss the allylic bromination using NBS with detail mechanism.

OR

B) Answer the following questions. **[06]**

i) Write a note on Moffatt oxidation.

ii) Discuss all synthetic applications of mercuric oxide as a reagent.

Q.6. A) Answer the following questions. **[06]**

i) Give the comparison between $LiAlH_4$ and $NaBH_4$ as reducing reagent.

ii) The product formation in TBTH reduction of halo alkenes depends on concentration of TBTH.Explain

B) Write a note on: **[06]**

i) Clemmensen reduction ii) Wolf Kishner reduction

OR

B) Answer the following questions. **[06]**

i) Explain the Birch reduction with mechanism.

ii) Describe the basic differences between reactivity of Gilman and Grignard reagents towards α,β-unsaturated aldehyde.