

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Chemistry-III

Subject Code : 4SC03CHC1

Branch: B.Sc.(Chemistry)

Semester : 3

Date : 22/04/2016

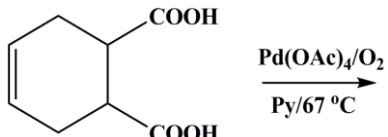
Time : 02:30 To 05:30

Marks : 70


Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

- Q-1 Attempt the following questions: (14)**
- a) What kind of bond cleavage leads to formation of carbocation? (1)
 - b) Arrange the following carbanions in order of their increasing stability. (1)
 - a. Vinyl, b. Allyl, c. Benzyl and d. Methyl carbanion.
 - c) What is the geometry of free radicals? (1)
 - d) Draw the reaction scheme for pinacol-pinacolone rearrangement. (1)
 - e) Write any one application of manganese dioxide reagent. (1)
 - f) Write the reaction outcome for following reaction. (1)



The reaction shows 1,2-cyclohexadiene-1-carboxylic acid (a cyclohexane ring with a double bond between C1 and C2, and a COOH group on C1) reacting with $\text{Pd(OAc)}_4/\text{O}_2$ in pyridine (Py) at 67°C .
 - g) Write the reaction outcome for following reaction. (1)



The reaction shows $\text{CH}_2\text{O} + \text{CH}_3\text{CHO} \xrightarrow{\text{OH}^-}$
 - h) Write the structure of Quinoline. (1)
 - i) What is the general name of Benzpyrrole? (1)
 - j) Give the names of any two methods for synthesis of benzofuran. (1)
 - k) Draw different resonating forms of benzothiophene. (1)
 - l) Write the structure of caffeine. (1)
 - m) Write the structure of theobromine. (1)
 - n) What are different constituent purine bases of nucleic acid? (1)

Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions (14)**
- a) What is resonance effect? Explain delocalization of π electrons through π - π and p- π overlap. (7)
 - b) Explain the classification of organic reactions based upon reaction mechanism. (7)



- Q-3 Attempt all questions (14)**
- a) What are different reactive intermediates formed during an organic reactions? Explain the hybridization and geometry of each reactive intermediate. (7)
- b) Draw and explain different steps involved in the mechanism of the benzilic acid rearrangement and Suzuki reaction. (7)
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- Q-4 Attempt all questions (14)**
- a) What is Diels-Elder reaction? Explain reaction mechanism, stereochemistry and application involved in the Diels-Elder reaction. (7)
- b) Draw reaction scheme for the synthesis of dimedone from diethylmalonate. (4)
- c) Write the reactions of organoboranes. (3)
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- Q-5 Attempt all questions (14)**
- a) Explain the synthesis and applications of LiAlH_4 in organic synthesis. (7)
- b) Discuss various methods of preparation of Diazomethane. (4)
- c) Draw different steps involved in the mechanism of Perkin reaction. (3)
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- Q-6 Attempt all questions (14)**
- a) What are different methods for synthesis of benzopyrrole? Draw and explain the reaction mechanism involved in the synthesis. (7)
- b) Discuss the chemical reactions of benzothiophene. (7)
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- Q-7 Attempt all questions (14)**
- a) Discuss various methods of synthesis of purines. (5)
- b) Write the reaction procedure for synthesis of caffeine and guanine from uric acid. (5)
- c) Draw the reaction scheme for synthesis of theophyllin from uric acid. (4)
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- Q-8 Attempt all questions (14)**
- a) What are different methods for synthesis of quinoline? Explain Skraup synthesis with reaction mechanism. (5)
- b) Write a note on isoquinoline. (5)
- c) Write a short note on Adenine. (4)

