



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2023/2024

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY AND BACHELOR OF SCIENCE (CHEMISTRY)

SCH 3352: SYNTHETIC ORGANIC CHEMISTRY II

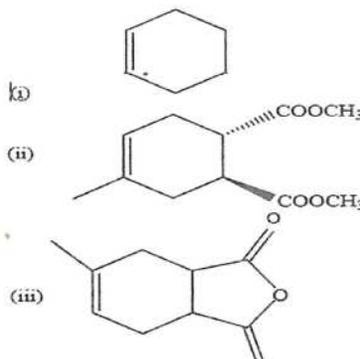
DATE: APRIL 2024

TIME: 2 HOURS

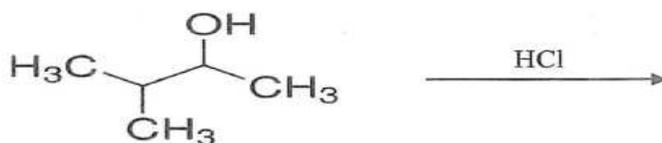
INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

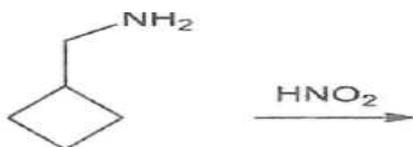
- What is a pericyclic reaction? (2 marks)
- Name three principle types of pericyclic reactions (3 marks)
- Outline four characteristics of Diels-Alder reaction (4 marks)
- Indicate the diene and dienophile that are needed to prepare each of the Diels-Alder products below (9 marks)



- e) Define carbonation rearrangement (2 marks)
- f) The reaction below proceeds through carbonation involving a hydride shift. Show the mechanism for the reaction and give the final product (5 Marks)

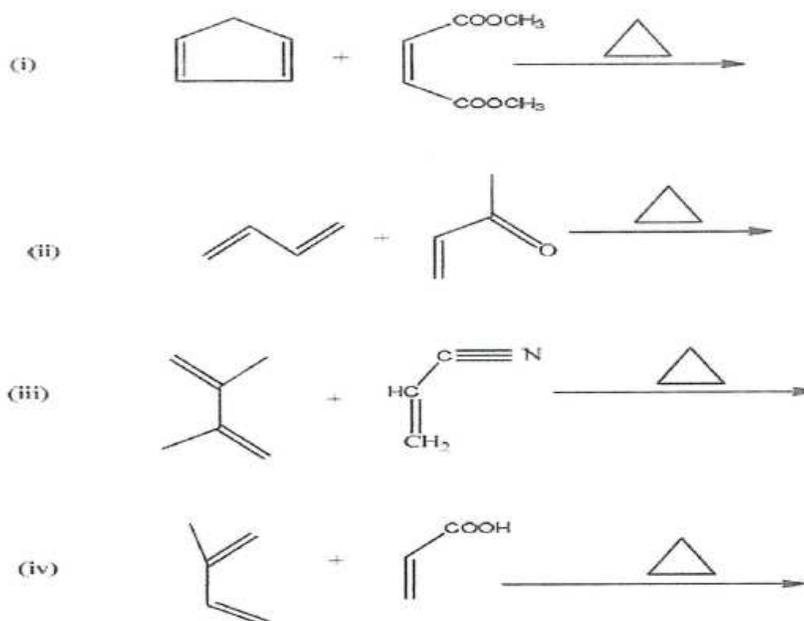


- g) What is Demjanov rearrangement reaction? (2 Marks)
- b) Predict the product for the following reaction; (3 Marks)



QUESTION TWO (20 MARKS)

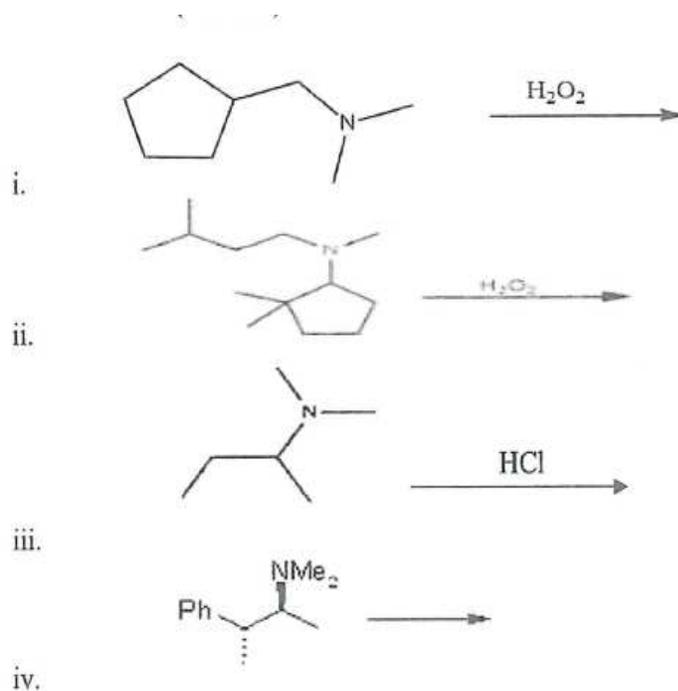
- a) What is a Diels-Alder reaction? (2Marks)
- b) Draw the products of the following Diels-Alder reactions; (8 Marks)



- c) What is cope elimination reaction? (2 marks)

d) Predict the major product from the following reactions carried out under high temperature;

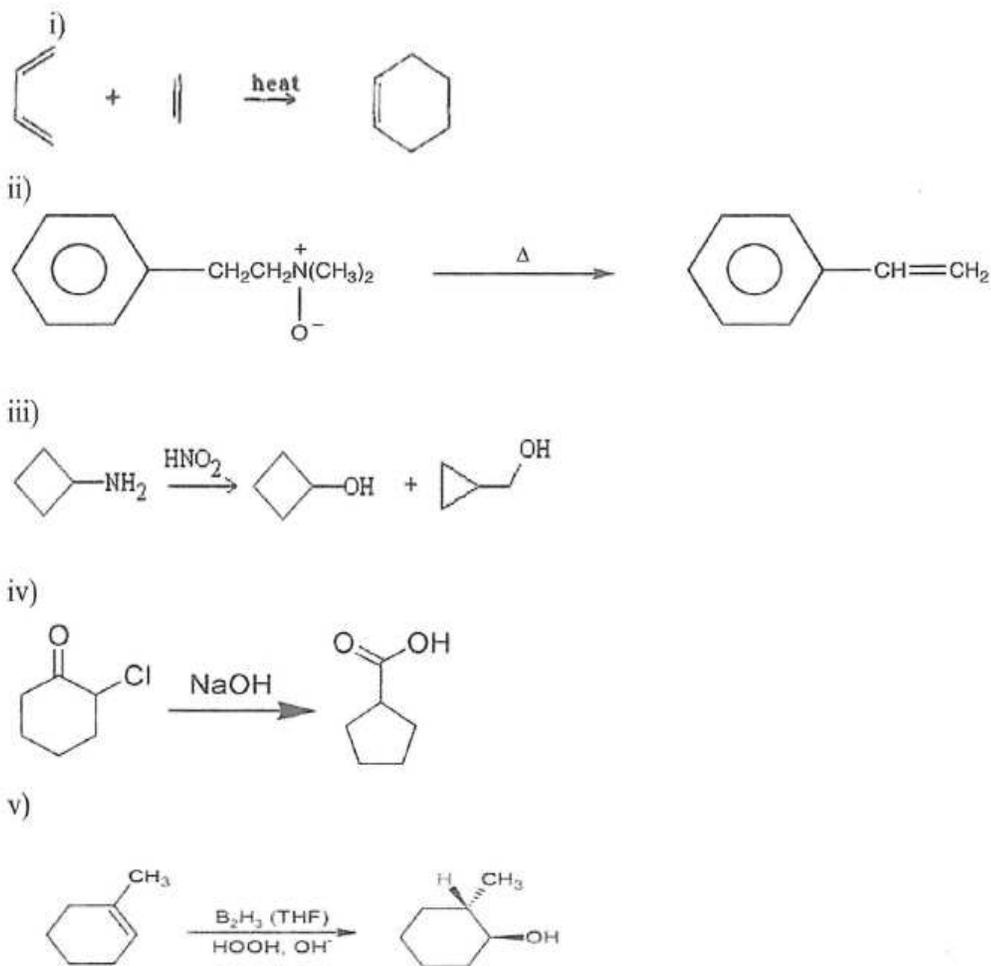
(8 marks)



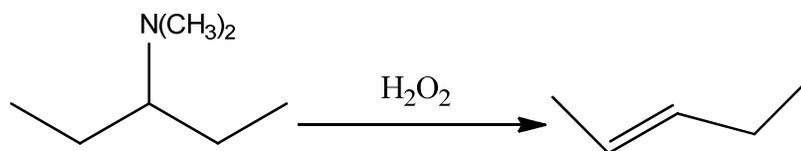
QUESTION THREE (20 MARKS)

a) Name the type of reaction involved in these transformations

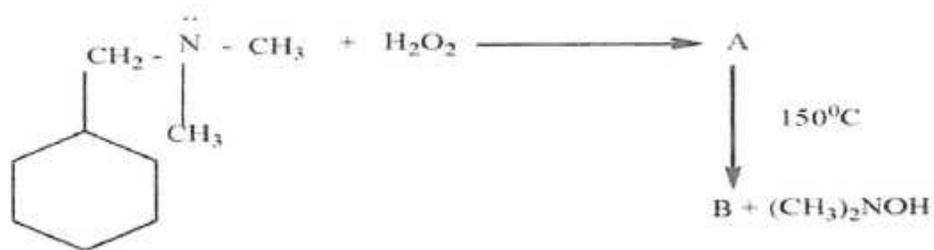
(5 marks)



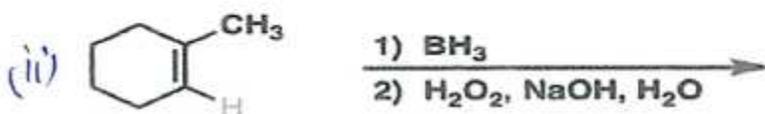
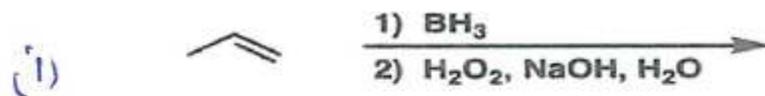
b) Using the Hoffmann cope elimination method, show the reaction mechanism for the preparation of pentene shown below (6 marks)



c) Complete the following cope elimination reaction by giving the nature and structure missing compounds in the mechanism (4 marks)

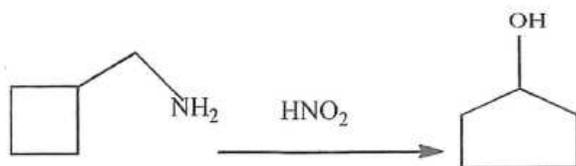


d) Give the products for the following hydroboration reactions; (5 marks)



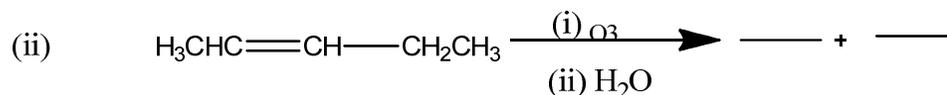
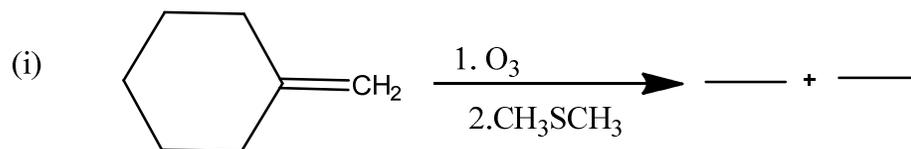
QUESTION FOUR (20 MARKS)

a) Propose the mechanism involved in the following Demjanov rearrangement reaction (6 marks)



b) (i) Identify the term ozonolysis (2 marks)

(ii) Identify the product formed in each case (4 marks)



c) (i) What is a Farvoskii rearrangement (2 marks)

(ii) Write the reaction mechanism involved in Farvoskii rearrangement (6 marks)

