

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS
2009/2010 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF EDUCATION
SCIENCE

COURSE CODE: CHEM 121

COURSE TITLE: ORGANIC CHEMISTRY

STREAM: SESSION II

DAY: THURSDAY

TIME: 9.00 – 11.00 A.M.

DATE: 08/04/2010

INSTRUCTIONS:

Attempt all questions

PLEASE TURN OVER

QUESTION ONE (20MARKS)

a. Define the following terms.

- i) Functional group
- ii) Isomer

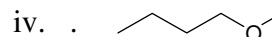
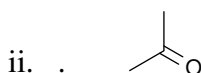
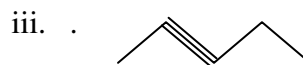
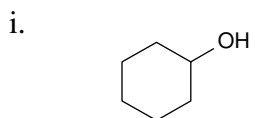
- iii) Stereoisomer
- iv) Nucleophile

(4marks)

b. Differentiate between saturated and unsaturated hydrocarbons, giving an example in each case.

(4marks)

c. Identify the functional groups associated with the following compounds.



(4marks)

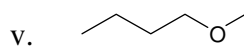
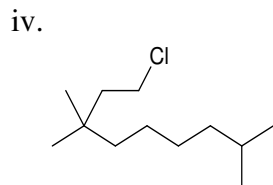
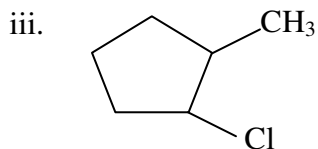
d. Which functional groups are associate with the following;

- i. Carboxylic acids
- ii. Alkynes

- iii. Alkylhalides

(3marks)

e. Give the IUPAC names for the following compounds.

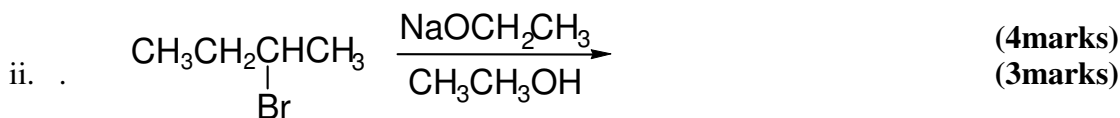
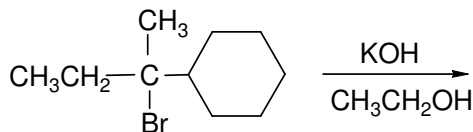


(5marks)

QUESTION TWO (20MARKS)

a. Draw all the products formed in the following reaction and give the major product.

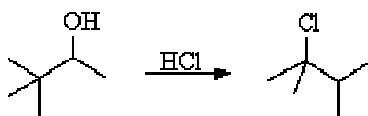
i. .



b. Show the mechanism for the chlorination of CH_4 into CCl_4 . (6marks)

c. What kind of hybridization would you expect in a CN bond in $\text{CH}_3\text{C}\equiv\text{N}$ bond? Illustrate using the MO theory. (4marks)

d. Draw a double headed curly arrow mechanism to account for the following experimental observation:



(3marks)

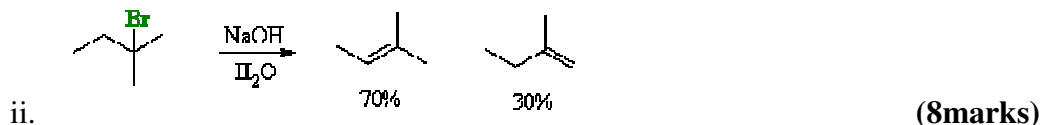
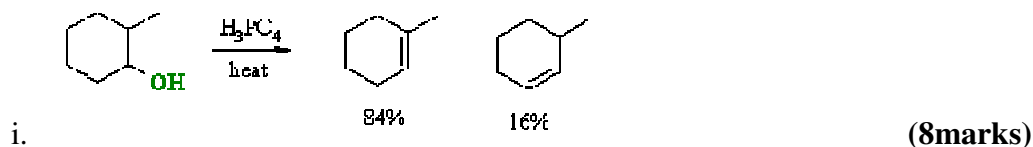
QUESTION THREE (20MARKS)

a. Determine the double bond stereochemistry (*E* or *Z*) for the following molecules.



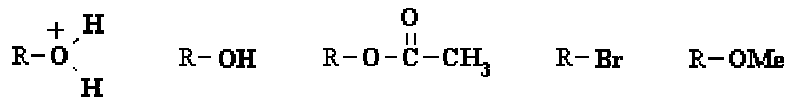
(4marks)

b. Show the mechanism involves in the formation of the following products and hence explain the variation in their product percentages.



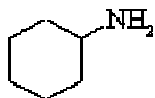
QUESTION FOUR (10MARKS)

- a. Differentiate between SN1 and SN2 reactions. (2marks)
b. How would you determine a good leaving group? (2marks)
c. Rank the groups (bold) in order of decreasing leaving group ability. Explain your choice.

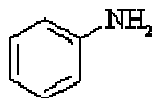


(2marks)

- d. Explain why cyclohexylamine (**1**) is more reactive than aniline (**2**) towards methyl iodide.



1



2

(4marks)