# JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

## UNIVERSITY EXAMINATIONS 2012/2013

## 1ST YEAR 1ST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMMUNITY HEALTH AND DEVELOPMENT & BACHELOR OF SCIENCE IN PUBLIC HEALTH

## (MAIN )

**COURSE CODE: SCH 3121**
**COURSE TITLE: ORGANIC CHEMISTRY**

**DATE: 22/4/2013** **TIME: 9.00-11.00AM**

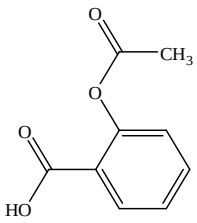
**DURATION: 2 HOURS**

**INSTRUCTIONS**

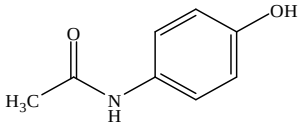
1. This paper contains TWO sections.
2. Answer ALL questions in section A (Compulsory) and ANY other Two questions in section B.
3. Write all answers in the booklet provided.

## QUESTION ONE (Compulsory) (30 marks)

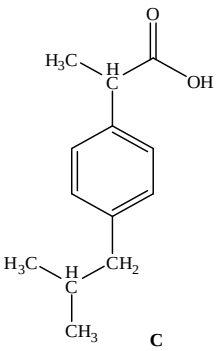
1. Compounds A, B and C are active ingredients in over-the-counter drugs used as analgesics (to relieve pain without decreasing sensibility or consciousness), antipyretics (to reduce the body temperature when it is elevated), and/or anti-inflammatory agents (to counteract swelling or inflammation of the joints, skin, and eyes). Identify at least ***two*** functional groups in each molecule [6 marks]



**A**

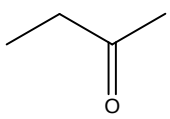


**B**

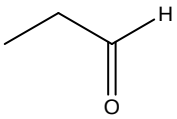


**C**

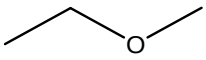
2.Refering to the compounds below, answer the questions that follow.



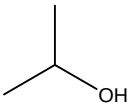
**A**



**B**



**C**

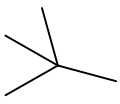


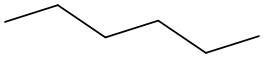
**D**

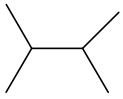
i. What is the relationship between molecules **C** and **D** above? Explain [2 marks]

ii.What is the difference between compound A and B? [2 mark]

3. Considering the following organic compounds, place them in order of increasing boiling point. Explain your reasoning. [4 marks]

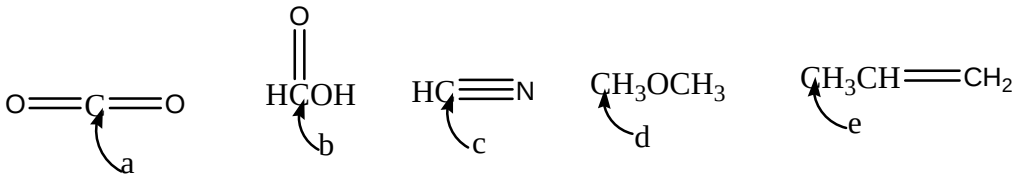

**E**


**F**


**G**

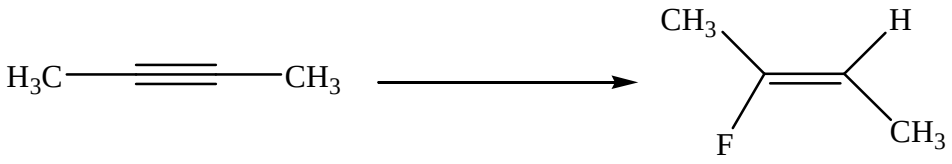
4. a. Define the term hybridization [3 marks]

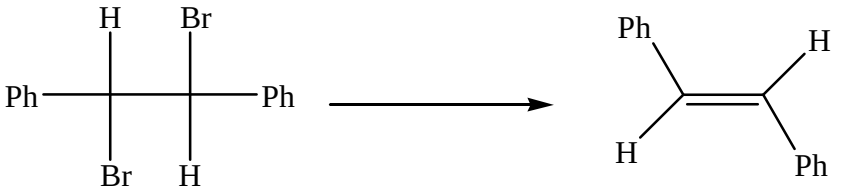
b. For each of the following compounds, state the hybridization at each of the carbon atoms indicated a- e. [5 marks]

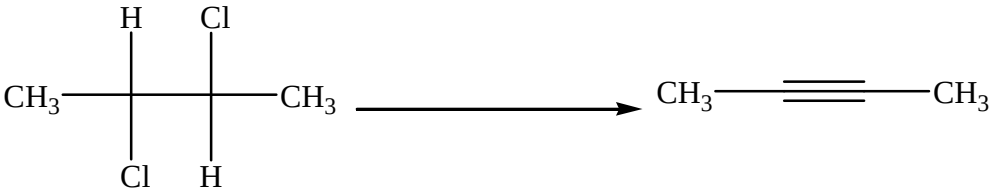


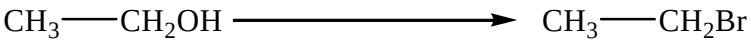

c. Explain the difference between structural isomers and stereoisomers. Provide an example in each case [2 marks]

5. Classify each of the following reactions as an Elimination, Addition or Substitution. [4 marks]

i. 


ii. 


iii. 


iv. 


6. Give names and structure of four alkyl groups [2 marks]

## QUESTION TWO (20 MARKS)

1. Draw the structures of the molecules named below [8 marks]

   a. 2-methylpropane

b. 2,4-dimethylheptane

c. 4,4-dimethyl-2,3-dimethyl heptane

d. 2,2,4-trimethylpentane

2. Name and draw the structures of four common cycloalkanes [8 marks]

3. Define and give an example of a geometrical isomer [4 marks]

**QUESTION THREE (20 MARKS)**

1. Give a brief description of what Organic Chemistry is [2 marks]

2. Define and give the two broad classes into which they are subdivided into [6 marks]

3. State and give an example for two methods of preparation os alkanes [6 marks]

4. State four physical properties of alkanes [4 marks]

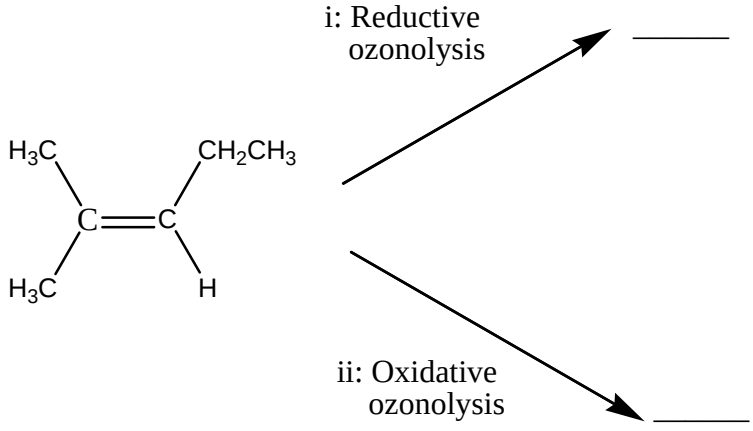
5. An alkyl group, generally represented by the symbol R. Name and draw four of them. [2 marks]

**QUESTION FOUR (20 marks]**

1. Briefly explain what is meant by the following terms [2 marks]

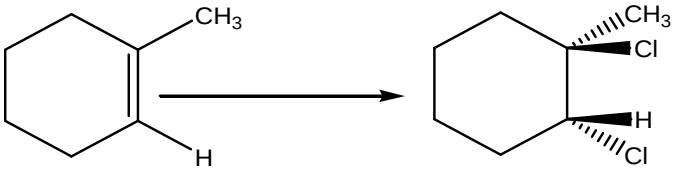
i.Covalent bond ii.Carbocation iii. Nucleophile iv. Electrophile

2. Give the products from the two ozonolysis reactions shown below [8 marks]

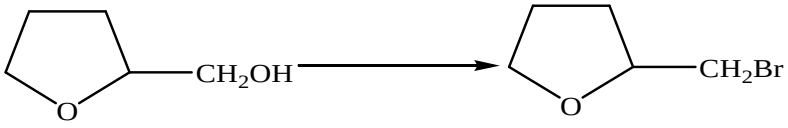


3. Give reagents that are necessary to perform the following transformations. [6 marks]

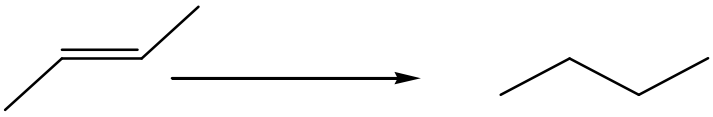
i.




ii.




iii.



4. State and explain two main factors that determine the boiling points of alcohols [4 marks]

## QUESTION FIVE (20 MARKS)

1. Illustrate the general steps involved in the $sp^3$formation. [8 marks]
2. With an example for each explain hydroganation and hydrohalogenation of alkenes. [8 marks]
3. Draw and show the stability order of alkyl carbocations [4 marks]