



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(PUBLIC HEALTH)

1ST YEAR 1ST SEMESTER

COURSE CODE: SCH 3112

COURSE TITLE: ORGANIC CHEMISTRY

EXAM VENUE:

STREAM: (BED SCI)

DATE:

EXAM SESSION:

TIME: 2:00 HRS

Instructions:

- 1. Answer question 1 (Compulsory) in Section A and ANY other 2 questions in Section B.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

INSTRUCTIONS: Answer Question 1 and any other TWO questions

QUESTION ONE (Compulsory) (30 marks)

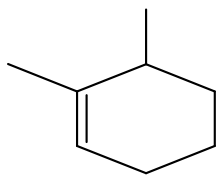
1. (a) Draw skeletal structures for:

- (i) 3-methylphenol
- (ii) 5-chloro-3-hexen-2-ol
- (iii) 3-methylcyclopentyne
- (iv) 1,4 – dimethylbenzene
- (v) 3-hydroxycyclopentanone.

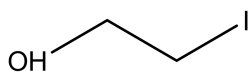
[10 marks]

(b) Give the IUPAC name for each of the following organic compounds:

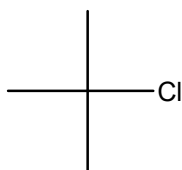
(i)



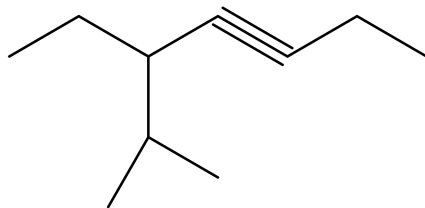
(ii)



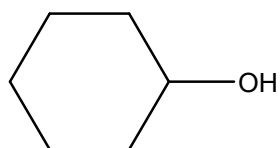
(iii)



(iv)



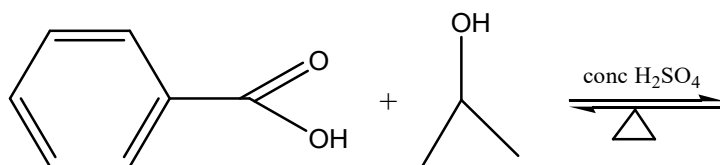
(v)



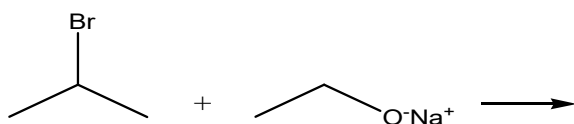
..... [10 marks]

(c) Complete the following reactions by giving the main organic product/s:

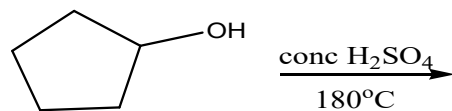
(i)



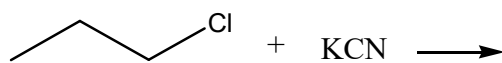
(ii)



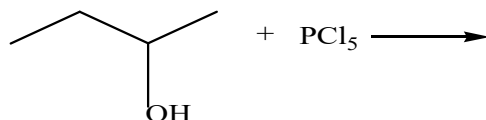
(iii)



(iv)



(v)



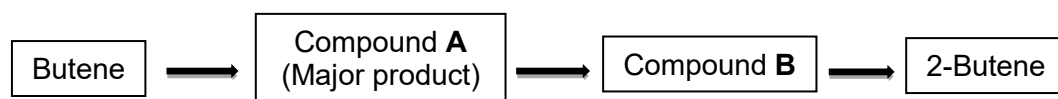
[10 marks]

QUESTION TWO (20 marks)

2. (a) Define or explain the following with the aid of an example:
- (i) Structural isomers [3 marks]
 - (ii) Aromatic hydrocarbon [3 marks]
- (b) Using an aldehyde CH_3CHO , differentiate between Tollen's and Benedict's test. [8 marks]
- (c) Define and give an example of a geometrical isomer [4 marks]
- (d) Give the general formula for a secondary alcohol. [2 marks]

QUESTION THREE (20 marks)

3. (a) Explain briefly why alcohols have much higher boiling points than alkanes of similar molecular mass. [2 marks]
- (b) The flow diagram below shows the steps used to convert butene to 2-butene.



- (i) Draw the structure of butene, using the line formula. [1 mark]
 - (ii) Compound **A** is formed when butene reacts with $\text{HCl}_{(g)}$. Using the line formula draw the structure of compound **A**. [1 mark]
 - (iii) Compound **A** is converted to an alcohol, compound **B**. What is the name of the reactant used? [1 mark]
 - (iv) Is compound **B** a primary, secondary or tertiary alcohol? [1 mark]
 - (v) Compound **B** is converted to 2-butene by heating the alcohol in the presence of concentrated H_2SO_4 . At what temperature does this occur? Draw this product. [2 marks]
- (c) State the uniqueness of carbon in organic chemistry. [4 marks]
- (d) Write the structures and IUPAC names of different chain isomers of alkanes corresponding to the molecular formula C_6H_{14} [6 marks]
- (e) Draw the structure of butyl benzoate. [2 marks]

QUESTION FOUR (20 marks)

4. (a) Draw the following using skeletal formulas;

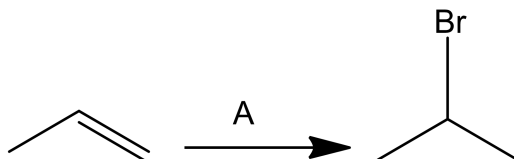
(i) 2-methylbutanoic acid

(ii) 2-fluorohexanal

(iii) ethylbutylamine

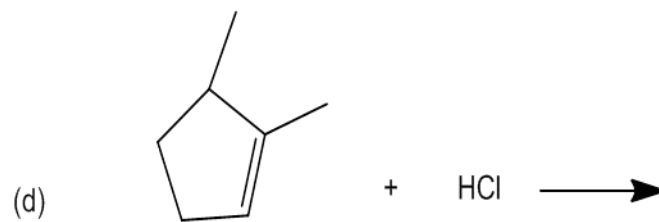
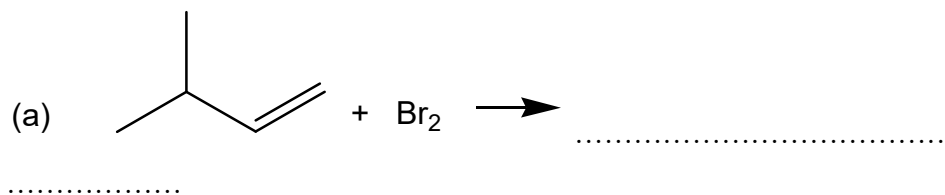
[6 marks]

(b) Fill in the missing reagent needed for the following reactions to take place and name the product



[3 marks]

(c) Complete the following organic reactions by giving the main organic product(s):



[8 marks]

(d) State 3 features of a homologous series

[3 marks]