



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)
1ST YEAR 1ST SEMESTER 2016/17
MAIN REGULAR

COURSE CODE: SCH 103

COURSE TITLE: BASIC ORGANIC CHEMISTRY

EXAM VENUE: PHY LAB

STREAM: (BED SCI)

DATE: 06/09/16

EXAM SESSION: 2.00 – 4.00 PM

TIME: 2:00HRS

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)

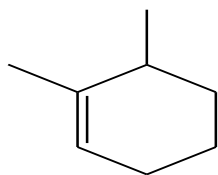
1. (a) Draw skeletal structures for:

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

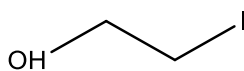
[10 marks]

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

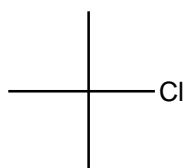
(i)



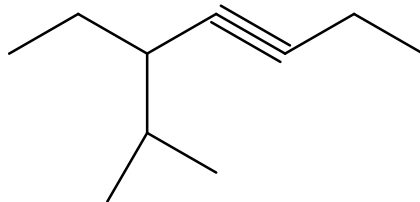
(ii)



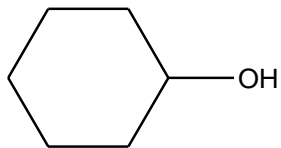
(iii)



(iv)



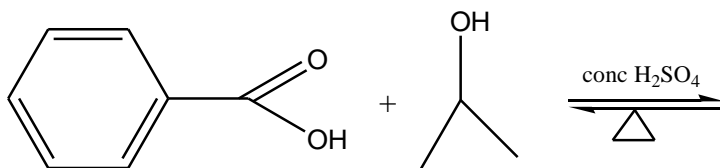
(v)



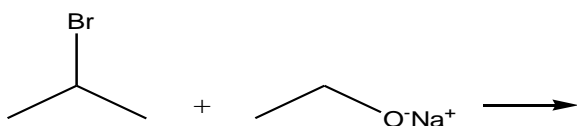
..... [10 marks]

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

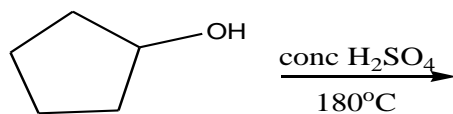
(i)



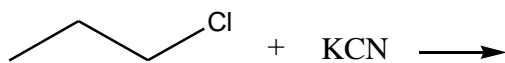
(ii)



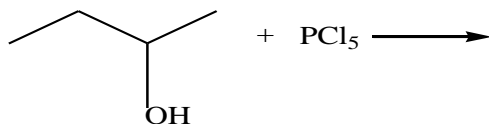
(iii)



(iv)



(v)



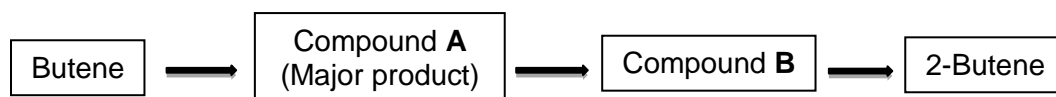
[10 marks]

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
 - (iii) draw the structure of compound **A**. [1 mark]
 - (iv) Compound **A** is converted to an alcohol, compound **B**. What is the name of the reactant used? [1 mark]
 - (v) Is compound **B** a primary, secondary or tertiary alcohol? [1 mark]
 - (vi) 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;

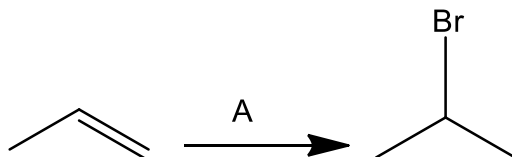
(i) 2-methylbutanoic acid

(ii) 2-fluorohexanal

(iii) ethylbutylamine

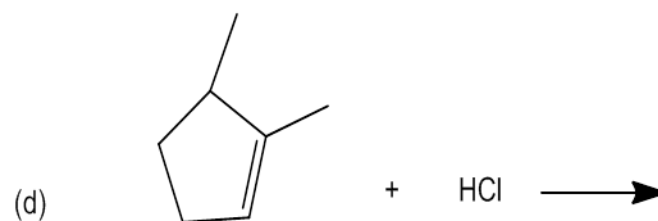
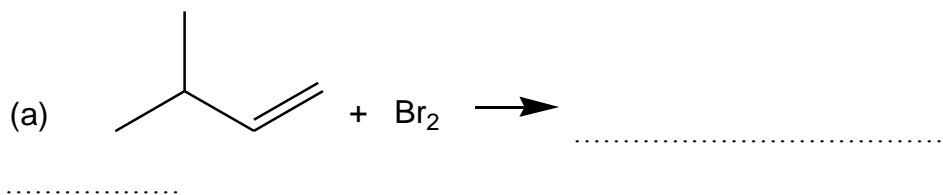
[6 marks]

(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]