



**TECHNICAL UNIVERSITY OF MOMBASA**

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR OF SCIENCE IN MARINE RESOURCES**

**ACH.4118: ORGANIC CHEMISTRY**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: Pick Date May 2016**

**Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

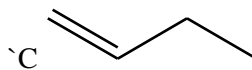
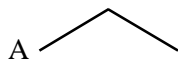
This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other **TWO** questions.

**Do not write on the question paper.**

**Question ONE**

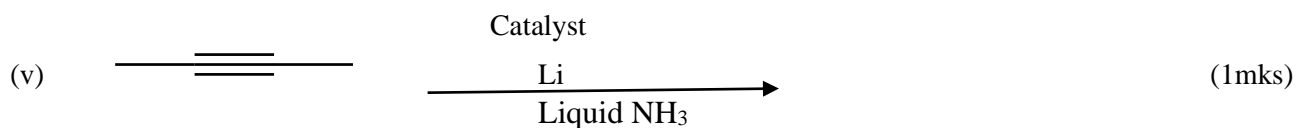
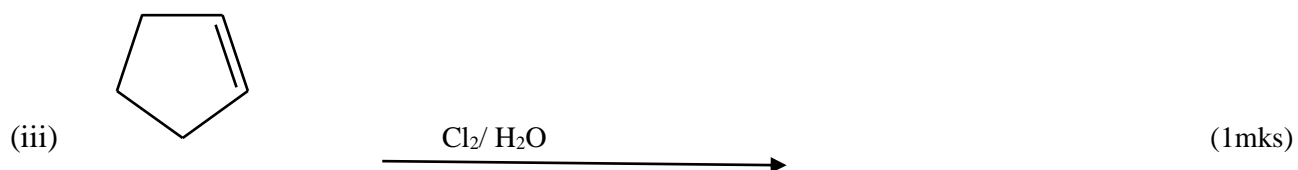
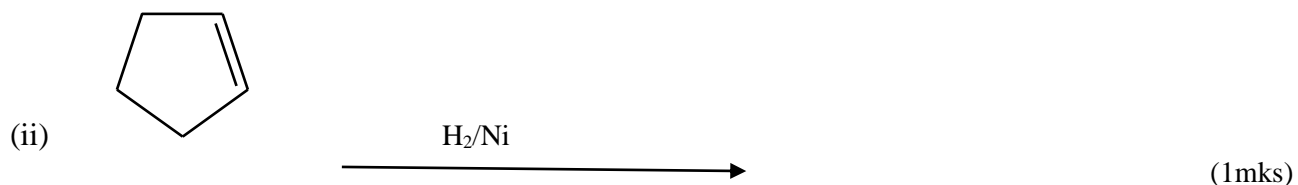
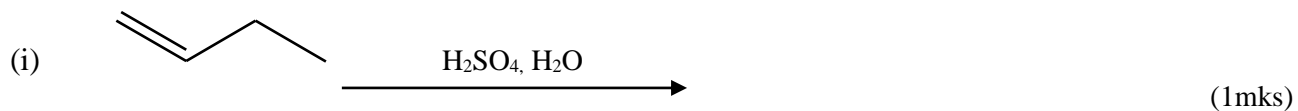
(a) Below are compounds A, B and Compound B is ethane.

B ———

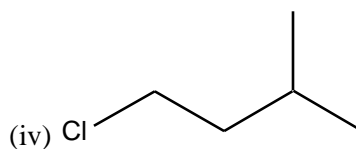
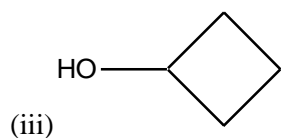
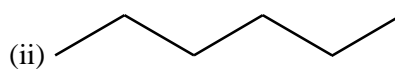
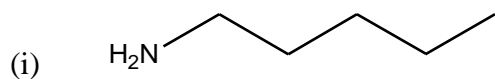


- (i) Name A and C (2mks)
- (ii) If the formula of ethane is  $C_2H_6$  give the formula of A and C. (2mks)
- (iii) State the general formula of substances A and B (2mk)
- (iv) Compound C is an unsaturated hydrocarbon. Explain (2mks)
- (v) When substance C is bubbled in bromine water, color change is seen. State color *changes from*-----  
-----to ----- - (2mks)

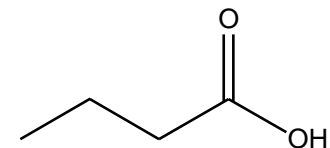
(b) Predict the major organic product(s) of each of the following reactions.



(c) Name the following organic compounds



(v)



(10 mks)

(d) On analysis, a compound with molar mass 120 g/mol was found to contain 12.0 g of carbon, 2.0 g of hydrogen and 16.0 g of oxygen. What is the molecular formula of the compound?

(5mks)

## Question TWO

(a) Explain the following citing an example in each case.

- (i) Markovnikoff's rule (3mks)
- (ii) Cracking (3mks)
- (iii) Oxidation of alkanes (3mks)
- (iv) Catalytic hydrogenation of alkenes (3mks)
- (v) Free radical substitution of alkanes (8mks)

## Question THREE

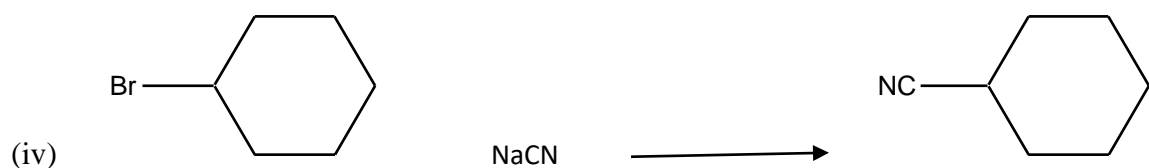
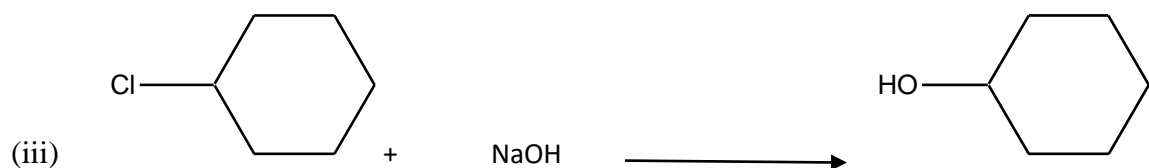
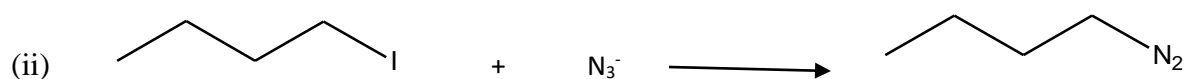
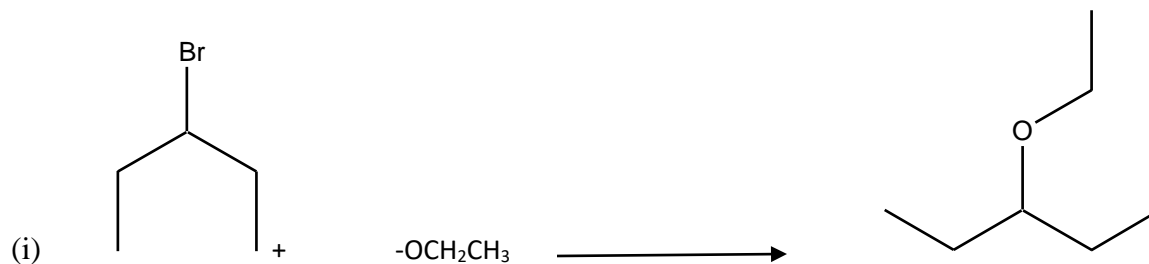
(a) Outline the mechanism for the

- (i) Halogenation of 2-butyne to 2,2,3,3-tetrachlorobutane (10mks)
- (ii) Hydration of 2-butyne to and subsequent tautomerization to a ketone (10mks)

## Question FOUR

(a) Outline any FIVE physical properties of amines (10mks)

(b) Identify the nucleophile and the leaving group and draw the products of each reaction





(10mks)

### Question FIVE

State TWO applications of each class of compounds below citing an example in each case

- |       |                    |        |
|-------|--------------------|--------|
| (i)   | Amines             | (4mks) |
| (ii)  | Aromatic compounds | (4mks) |
| (iii) | Alkynes            | (4mks) |
| (iv)  | Alcohols           | (4mks) |
| (v)   | Carboxylic acids   | (4mks) |