



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.

Tel: +254 (0)799529958, +254 (0)799529959, +254 (0)712524293

Website: [www.must.ac.ke](http://www.must.ac.ke) Email: [info@must.ac.ke](mailto:info@must.ac.ke)

## University Examinations 2022/2023

SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY, BACHELOR OF SCIENCE IN AGRICULTURE, BACHELOR OF SCIENCE IN AGRICULTURAL, EDUCATION AND EXTENSION

### SCS 3050: ORGANIC CHEMISTRY

DATE: APRIL 2023

TIME: 2 HOURS

INSTRUCTIONS: *answer question one and any other two questions*

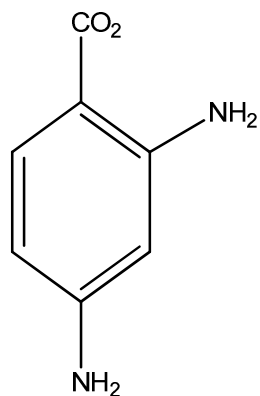
#### QUESTION ONE (30 MARKS)

a) Define the following terms as used in Organic Chemistry

- (i) Electrophilic substitution reaction (2 marks)
- (ii) Functional group (2 marks)

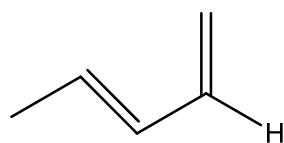
b) Identify the functional groups in the following compounds





(iv)

(2 mark)



(v)

(2 marks)

c) Write the electron configuration of the following elements

(i) Carbon

(2 marks)

(ii) Oxygen

(2 marks)

d) Explain by use of illustrations the hybridization of carbon in ethane

(4 marks)

e) Differentiate between ring activating groups and ring deactivating groups. Give two examples in each case

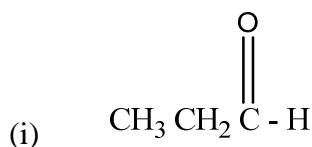
(6 marks)

f) What is the main structural difference between aldehydes and ketones?

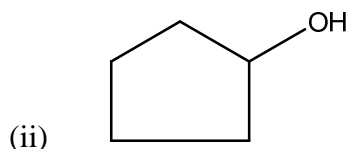
(2 marks)

## QUESTION TWO (20 MARKS)

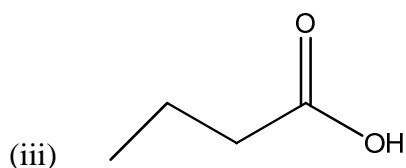
a) Give IUPAC names of the following compounds



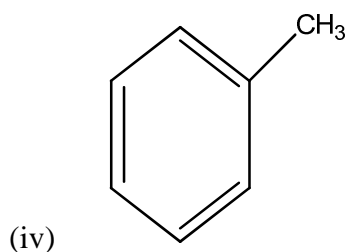
(2 marks)



(2 marks)



(2 marks)



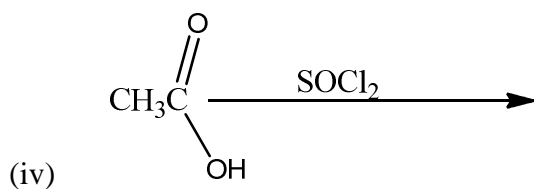
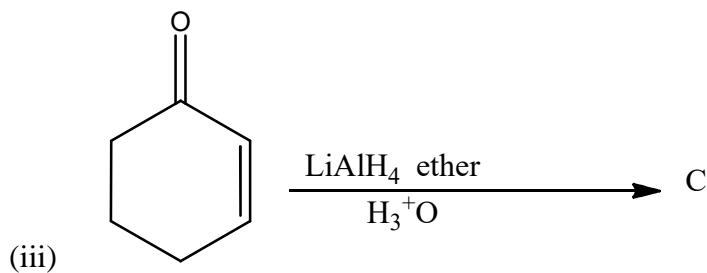
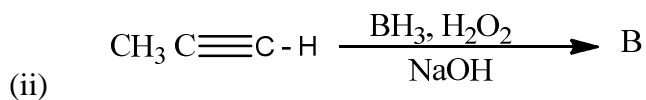
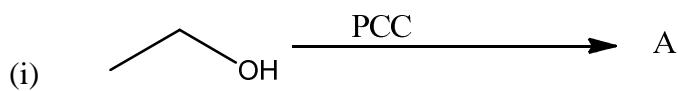
(2 marks)

b) State the aufbau's principle

(2 marks)

c) Identify the products represented by letters A, B and C below

(4 marks)



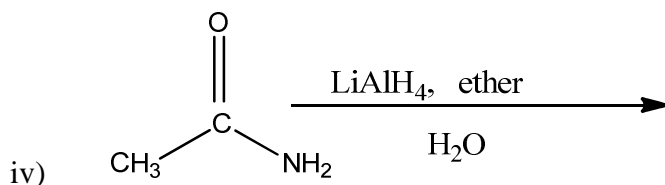
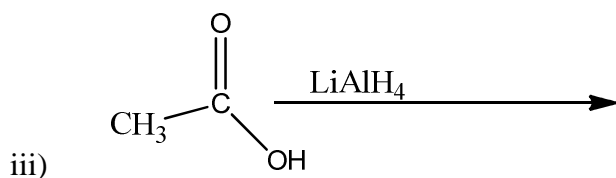
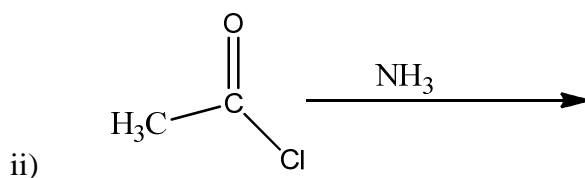
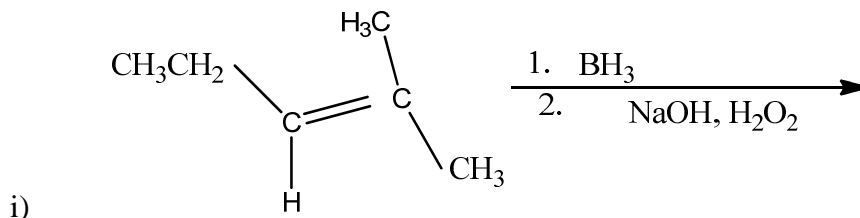
d) By use of suitable equations describe three methods of synthesizing alcohol

(6 marks)

### QUESTION THREE (20 MARKS)

a) Predict the products of the following reactions

(8 marks)



b) Draw the structures of the following organic compounds

(10 marks)

- 2 – methylPentanol
- 3 – bromo Pentanal
- Glycohexylamine
- 1, 4 butanedlamine
- 4 – methylpentanoic acid

c) What is a carbocation?

(2 marks)

**QUESTION FOUR (20 MARKS)**

- a) Benzene is treated with mixture of concentrated nitric and sulphuric acids keeping the temperature below 50°C. By use of curly curves show the reaction mechanism (10 marks)
- b) By use of suitable equations describe methods used to synthesize carboxylic acids (8 marks)
- c) Ethanoic acid has higher boiling point than ethanoic acid. Explain (2 marks)