

UNIVERSITY OF FORT HARE

PAC 223

DEGREE EXAMINATIONS SUPPLEMENTARY 2019

Time : 3 HOURS
Subject: ORGANIC CHEMISTRY 2
Marks : 100

This paper consists of 6 pages including the cover page

Internal Examiners

Mr. N. Manene

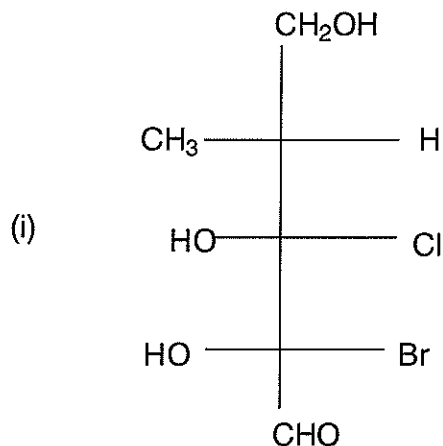
Prof. B. Aberibigbe

Instructions

1. Answer any **five** questions

Question One

- (a) Assign R or S designation for each stereocentre of each of the structures shown below:



(8)

- (b) Only two kinds of motion are allowed for the Fischer projections, state and show them by making use of suitable examples.

(6)

- (c) Reaction of 1-butene with HBr yields an optically inactive product. Explain this with aid of a reaction mechanism.

(6)

[20]

Question Two

- (a) Explain, with the use of suitable examples the meaning of the following terms:

- (i) meso- compound
 (ii) racemic modification

(4)

- (b) Using equations give three reactions that could effect the following transformations



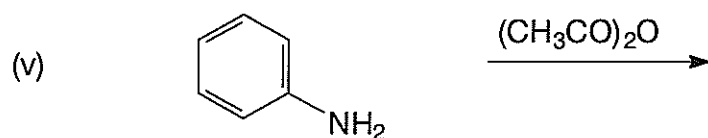
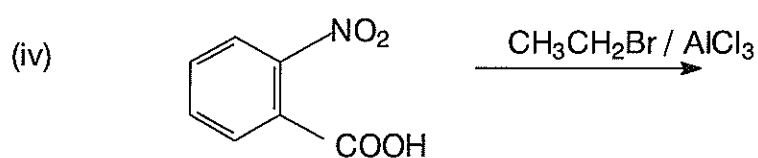
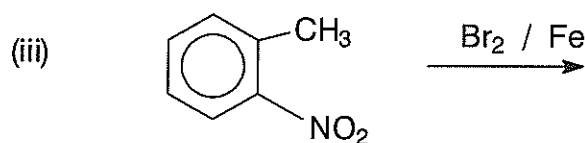
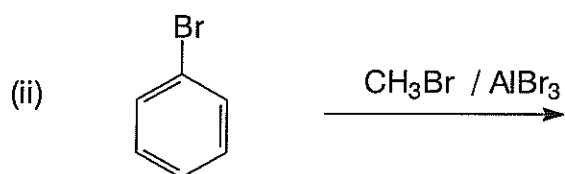
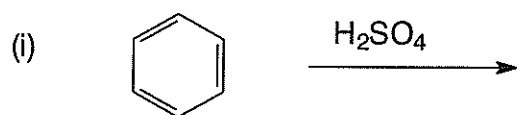
(6)

(b) Discuss using examples the limitations of the Friedel - Crafts alkylation reaction in aromatic substitutions.

(10)
[20]

Question Three

(a) What are the expected major product(s) of each of the following reactions:



(10)

(b) What is the major product that would be formed from the Friedel-Crafts reaction of benzene and 1-chloro-2-methyl propane in the presence of AlCl_3 ? Give the mechanism for the formation of this product.

(5)

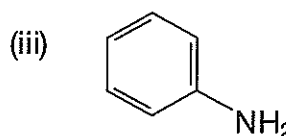
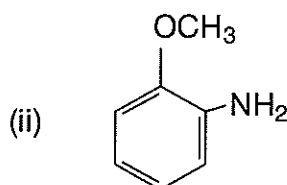
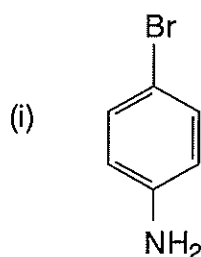
- (c) Draw the resonance structures for the intermediates from attack of an electrophile at the ortho, meta, para positions of nitrobenzene. Which intermediates are most favored?

(5)

[20]

Question Four

- (a) Arrange with suitable evidence the following compounds in the order of increasing basicity ;



(6)

- (b) Phenols are said to be more acidic than aliphatic alcohols, Explain this with the use of resonance structures.

(4)

- (b) Outline a mechanism for each of the following reactions :

- (i) Reaction of CH_3MgBr with ethyl acetate which yields a tertiary alcohol. (5)
- (ii) Diazotization of aniline. (5)

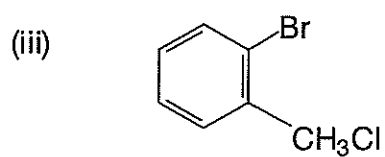
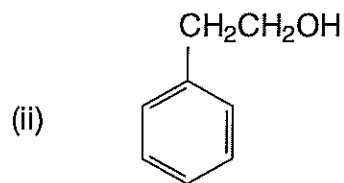
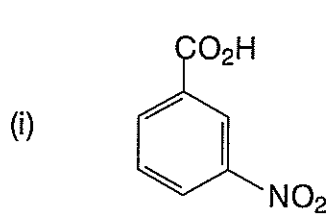
[20]

Question Five

- (a) Using curly arrows show how each of the following conversions is effected:
- (i) Bromo benzene is treated with liquid sodium amide in liquid ammonia to yield aniline.
- (ii) p-Nitro chlorobenzene reacts with potassium ethoxide to yield p-methoxy nitrobenzene.

(8)

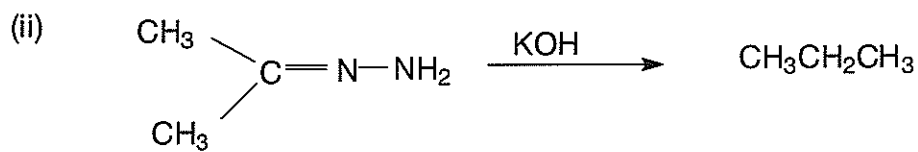
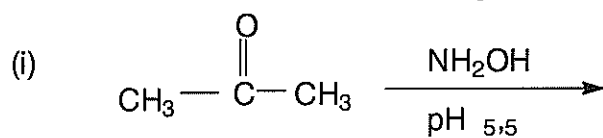
- (b) Using benzene as the starting material, devise a synthesis for each of the following compounds:



(12)
[20]

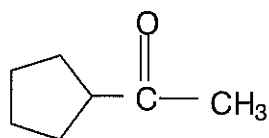
Question Six

(a) Give the mechanisms of the following reaction



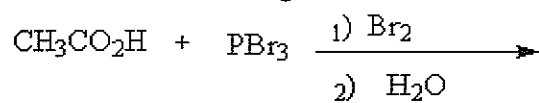
(10)

© Give the mechanism of the following reaction



PREPARE FROM ACETO ACETIC ESTER

(b) Give the mechanism of the following **Hell-Volhard Zelinsky** reaction (5)



(5)
[20]

END