

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR

**FOR THE DEGREE OF BACHELOR OF EDUCATION
SCIENCE**

COURSE CODE: CHEM 312

COURSE TITLE: ORGANIC CHEMISTRY III

STREAM: SESSION VI

DAY: WEDNESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 12/08/2009

INSTRUCTIONS TO CANDIDATES:

Ø Attempt all questions

PLEASE TURN OVER

QUESTION ONE (15 MARKS)

a) Define the following terms;

i. Nucleophile

ii. Electrophile.

(1mark)

b) Explain the following observations.

i. The carbonyl carbon is electrophillic.

(2marks)

ii. Aldehydes and ketones have considerable solubility in water.

(2marks)

c) Give the structural formulae to the following IUPAC names of compounds.

(5marks)

i. 3-buten-2-one

ii. 3-methyl-2-butenone

iii. 2-chloropentanal

iv. Hexanal

v. Butanoic acid.

d) Assign names to the following compounds.

(5marks)

i. $\text{CH}_3\text{COCH}_2\text{CH}(\text{CH}_3)_2$

ii. $\text{CH}_3\text{CH}_2\text{COCH}(\text{CH}_3)_2$

iii. $\text{CH}_3\text{CH}_2\text{COOH}$

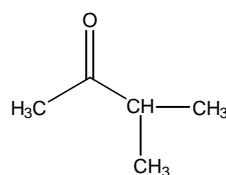
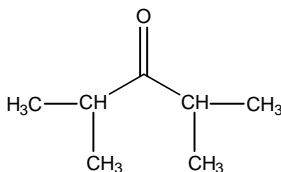
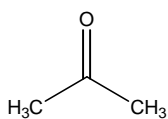
iv. CH_3CHO

v. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$

QUESTION TWO (15MARKS)

a) Arrange the following ketones in order of increasing reactivity.

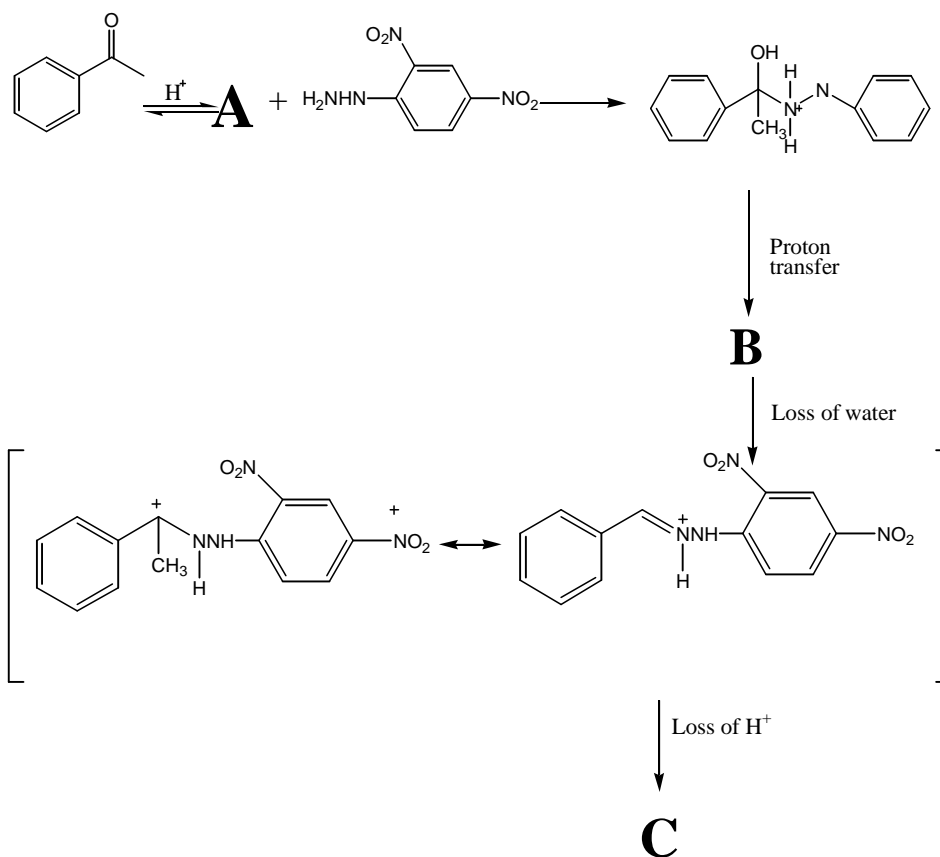
(3marks)



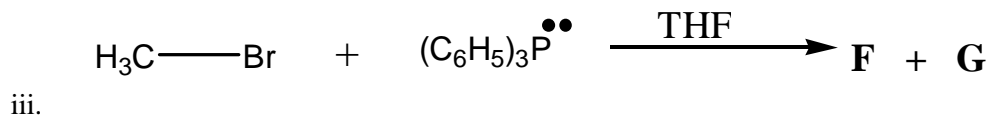
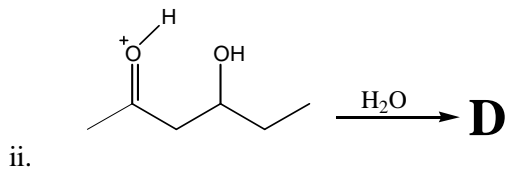
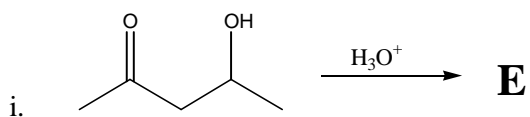
b) Outline the synthesis of ethyl benzoate starting with methyl benzoate.

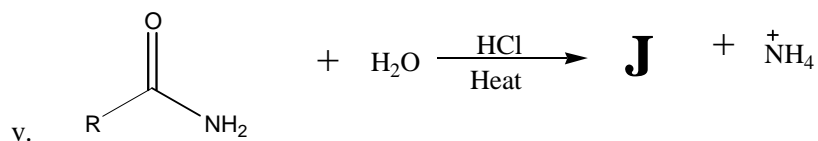
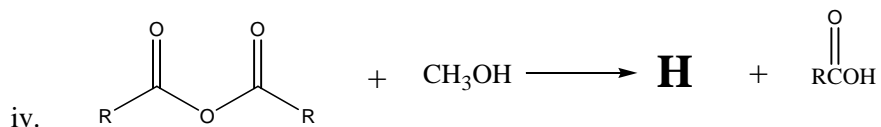
(3marks)

c) Identify the missing products in the following synthetic pathway. (3marks)



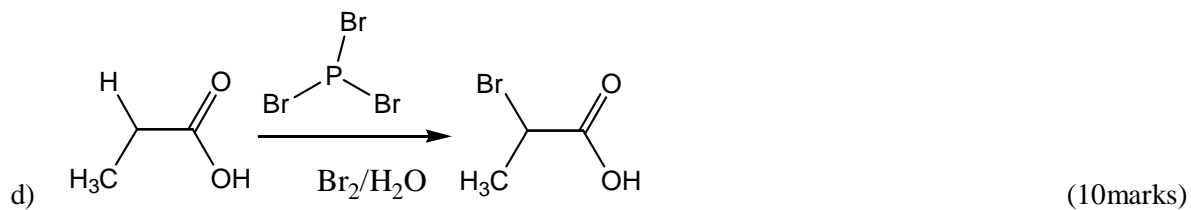
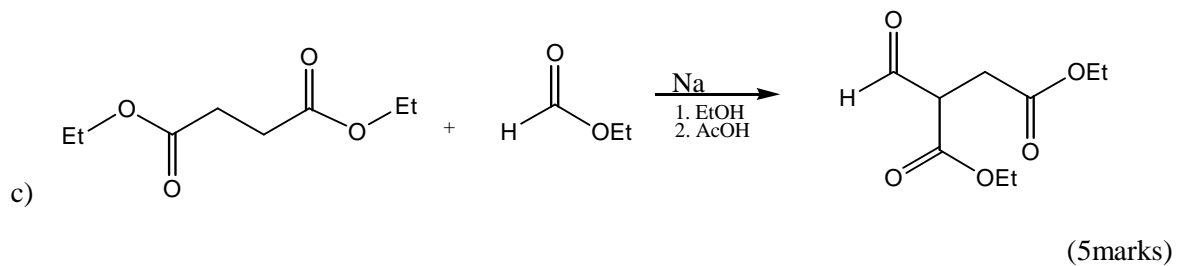
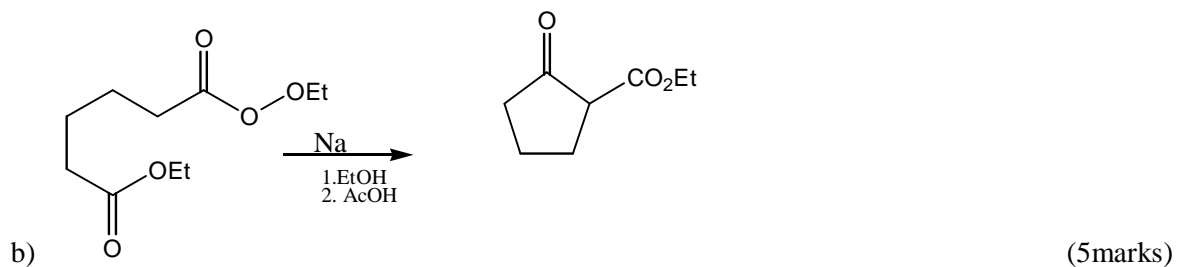
b) Identify the products in the following reactions. (6marks)





QUESTION THREE (20MARKS)

a) Propose a possible reaction mechanism for the synthesis of the following compounds as outlined in the following equations.

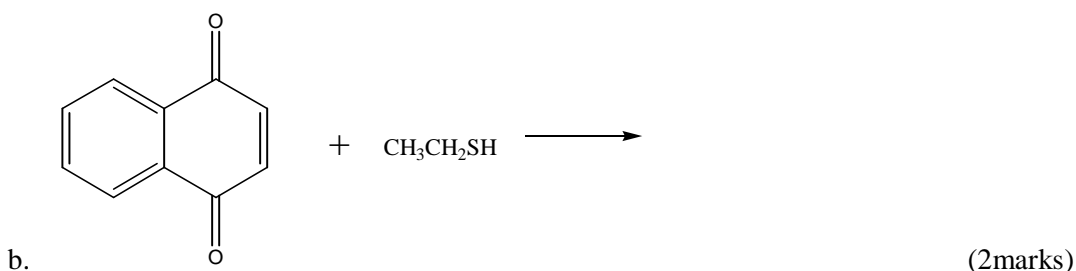
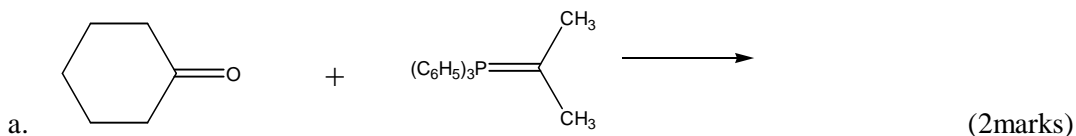


QUESTION FOUR (20MARKS)

a) Define the term Ylide and give an example. (2marks)

b) Differentiate between stabilized and unstabilized ylides. (2marks)

c) Complete the following reactions.



d) Outline the synthesis of Phthalic acid from Phthalimide. (5marks)

e) Propose a reaction mechanism for the synthesis for the β -keto ester as outlined in the equation below.

