



UNIVERSITY EXAMINATIONS

FIRST SEMESTER 2025/2026 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREES OF
BACHELOR OF EDUCATION (SCIENCE) AND BACHELOR
OF SCIENCE (GENERAL)**

CHEM 312: ORGANIC CHEMISTRY III

STREAM: BEd (Sc), BSc (Gen)

TIME: 2 HRS

DAY: THURSDAY[11.30 – 13.30 P.M]

DATE: 29/01/2026

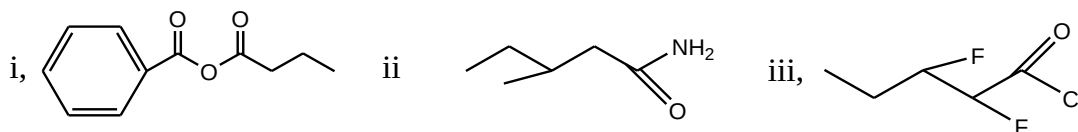
THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

Attempt ALL the Questions**QUESTIONS ONE (30 MARKS)**

a Use the IUPAC naming system to name the following compounds.

(3 Marks)



b, Draw the following structure:

(3 Marks)

i, Octanedioic acid

ii, Ethylheptanoate

iii, N-Ethyl-N-propylaniline

c, Explain why Amides have higher Boiling points

(2 Marks)

d, Outline the mechanism of Amide (Propanamide) hydrolysis in acid solution .

(10 Marks)

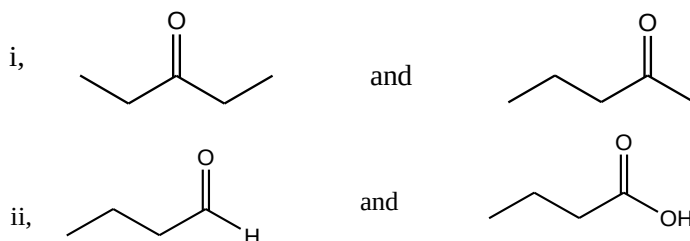
e, Write the mechanism for the synthesis of 3-Ethyl-2-heptanone via Ethylacetoacetate



(9 Marks)

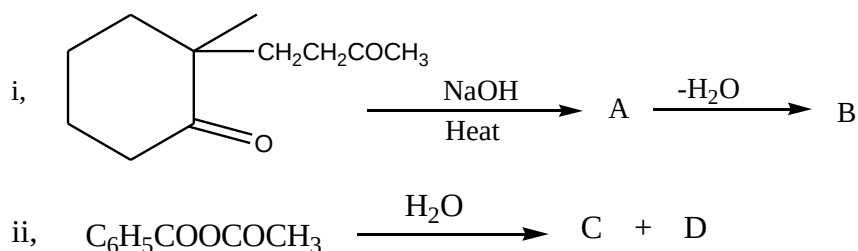
f, Describe a simple chemical test that would distinguish between each of the following compounds.

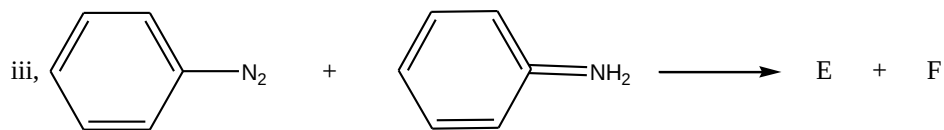
(3 Marks)

**QUESTIONS TWO (20 MARKS)**

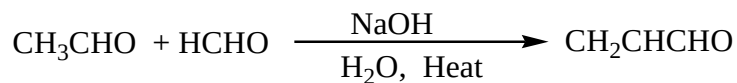
a, Write the products of the following reactions.

(6 Marks)

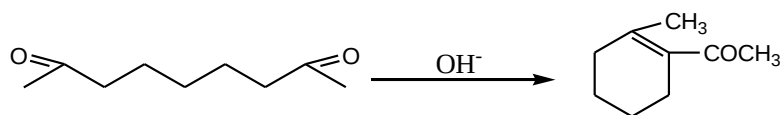




i, Outline the mechanisms of the following reactions **(8 Marks)**



ii, **(6 Marks)**



QUESTION THREE (20 MARKS)

a) Outline the mechanism of $\text{CH}_3\text{CH}_2\text{COOCH}_3$ Hydrolysis in base **(8 Marks)**

b) Show how you would synthesize Bromobenzene from Benzene via diazonium ion **(3.5 Marks)**

c) Use Malonic $\text{CH}_2(\text{COOCH}_2\text{CH}_3)_2$ to outline the synthesis of 2-Methylbutanoic acid. **(8.5 Marks)**