



UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREES OF
BACHELOR OF SCIENCE (GEN), BACHELOR OF
EDUCATION (SCIENCE)**

CHEM 312: ORGANIC CHEMISTRY III

STREAM: R

TIME: 2 HRS

DAY: THURS [8.30AM – 10.30AM] DATE: 08/12/2022

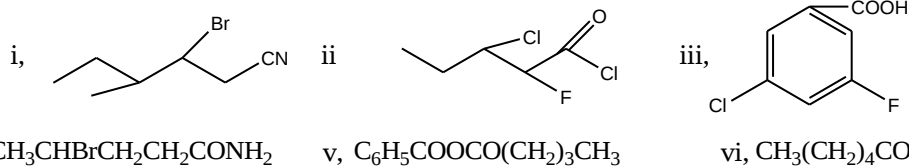
THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS: - Attempt ALL the Questions**QUESTION ONE**

(a) Use the IUPAC naming system to name the following compounds. (6 marks)

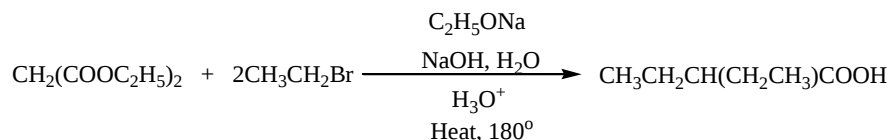


(b) Draw the following structure: (6 marks)

- (i) Octanedioic acid
- (ii) 4-Bromo-2-methylheptanoyl chloride
- (iii) Benzoic anhydride
- (iv) 3-Ethyl-2-methylpentylheptanoate
- (v) 3-Chloro-N-ethylaniline
- (vi) 2-Fluoro-3-methyloctanenitrile

(c) Explain why carboxylic acids have higher Boiling points than their corresponding Alcohols (3 marks)

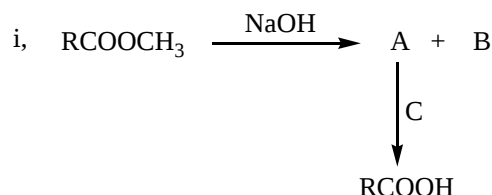
(d) Write the mechanism of the following reaction. (10 marks)

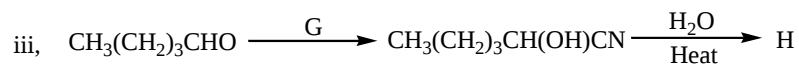
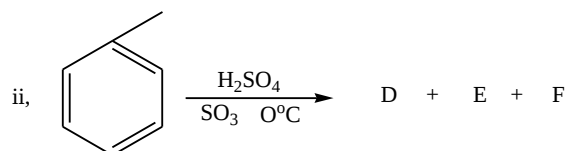


(e) Write the general mechanism of basic hydrolysis of Amides. (5 marks)

QUESTION TWO

(a) Write the missing products and reagents of the following reactions. (4 marks)

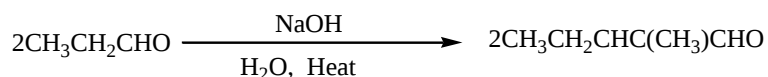




(b) (i) Define Aldol Condensation. (1 mark)

(ii) Show the mechanism of the aldol condensation of the following reaction.

(8 marks)

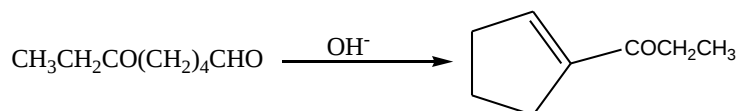


(c) Show how you would carry out the transformation of Benzene to Phenol. (7 marks)

QUESTION THREE

(a) Show the general mechanism of Acid Catalyzed Ester Hydrolysis (12 marks)

(b) Write the mechanism of the following reaction. (6 marks)



(c) Describe a simple chemical test that would distinguish between each of the following compounds. (2 marks)

