



**NATIONAL OPEN UNIVERSITY OF NIGERIA PLOT 91, CADASTRAL ZONE,
NNAMDI AZIKIWE EXPRESSWAY, JABI – ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2025_2 EXAMINATIONS**

COURSE CODE: CHM 416

COURSE TITLE: ORGANIC SYNTHESIS

COURSE UNIT: 2

INSTRUCTION: Answer question one (1) and any other two questions

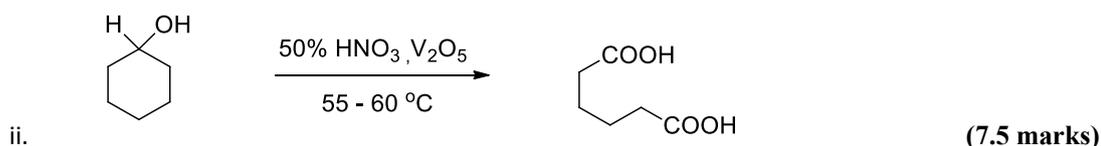
Time: 2 Hours

1a) What are the starting materials and reaction condition for Reformatsky reaction **(5 marks)**

b) Write short note on oxidation of tertiary alcohol **(5 marks)**

c) Give the product of reaction of $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH}$ and $\text{CH}_3\text{CH}_2\text{Cl}$ in NaNH_2 **(5 marks)**

d) Give the product(s) of the following reactions:



2a) Under what condition can benzene be converted to cyclohexane **(5 marks)**

b) What is Perkin Reaction? **(5 marks)**

c) List five (5) reagents that are common oxidizing agents **(10 marks)**

3a) With the aid of equation, show oxidation of p-xylene to dicarboxylic acid **(10 marks)**

b) Give the product(s) of the reaction below;



c) Copy and complete the equation below;



4a) Describe the mechanism of Wolff-Kishner reaction **(5 marks)**

b) With aid of chemical equation, describe Glaser coupling **(5 marks)**

c) List five metals commonly used in reduction reaction **(10 marks)**

5a) Give the equation for the conversion of an alkene to an epoxide by a peroxyacid **(8 marks)**

b) Explain the following terms:

i. Hydroxylation **(4 marks)**

ii. Oxidative cleavage **(4 marks)**

iii. Epoxidation of alkenes **(4 marks)**