



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE & APPLIED SCIENCES**  
**2023\_2 EXAMINATIONS**

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**COURSE CODE: CHM 416**

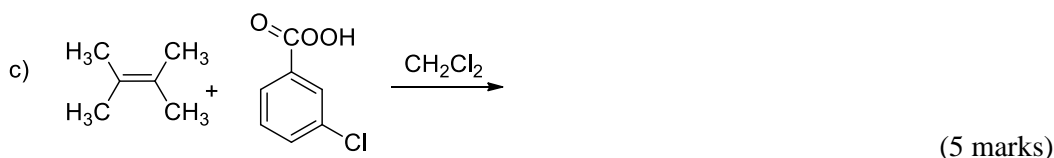
**TIME ALLOWED: 2 Hours**

**COURSE TITLE: ORGANIC SYNTHESIS**

**CREDIT: 2 Units**

**INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions**

Q1. Give the product(s) of the following reactions:



d. Write short note on each of the following unique reactions:

i) Oxidation of tertiary alcohol (5 marks)

ii) Perkin Reaction (5 marks)

Q2. Copy and complete the following reactions furnishing the correct products



Q3. a) With the aid of equation, show oxidation of p-xylene to dicarboxylic acid (5 marks)

b) Under what condition can benzene be converted to cyclohexane (5 marks)

c) Distinguish between  $\text{LiAlH}_4$  and  $\text{NaBH}_4$  based on their functions (5 marks)

- Q4a) With equation, show the preparation of ethyne from carbide raw material (5 marks)
- b) List five metals commonly used in reduction reaction (5 marks)
- c) With brief explanation and chemical equation, describe Glaser coupling (5 marks)
- Q5 a) Outline scheme for the preparation of 3-heptyne from ethyne (10 marks)
- b) What is the meaning of PCC and its advantage over  $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$  (5 marks)