



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI – ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
2020_2 EXAMINATION

COURSE CODE: CHM 416

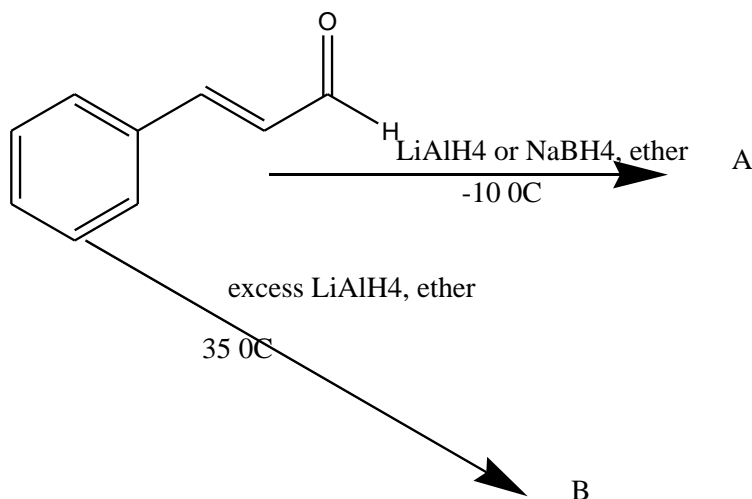
TIME ALLOWED: 2 Hours

COURSE TITLE: ORGANIC SYNTHESIS

CREDIT: 2 Units

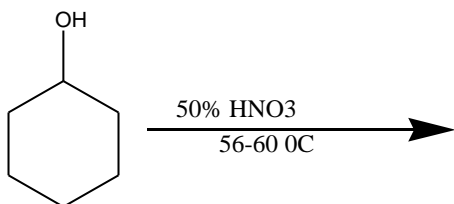
INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

1. a. Define organic chemistry [2 marks]
b. Complete the following reactions and name the products A and B. [10 marks]



- c. Outline three examples to illustrate the oxidation process [6 marks]
d. i. Draw the structure of tetracycline [5 marks]
e. ii. List two catalyst commonly used in hydrogenation of unsaturated organic compounds [2 marks]
2. a. With the aid of chemical formulae, give four examples of peracids [8 marks]
b. Both primary and secondary alcohol oxidise to give carbonyl compounds but tertiary alcohol cannot. Explain. [7 marks]
3. a. i. With the aid of chemical equation, show the oxidation of p-xylene to dicarboxylic acid. [4 marks]
ii. What is the name of the product formed in 3(a)(i) above? [2 marks]
b. i. What is hydroxylation? [2 marks]
ii. With the aid of equation, show the oxidation of 4-ethylcyclohexanol and name the product [7 marks]

4. a. List two methods of converting carbonyl group to CH_2 group [4 marks]
b. Give three examples of suitable solvents for ozonisations [6 marks]
c. The reduction of benzene to cyclohexane via catalytic hydrogenation is difficult. At what conditions can benzene be more easily reduced? [5 marks]
5. a. Complete the reaction below and name the product. [7 marks]



- b. i. Outline *three* types of reduction reactions [4.5 marks]
ii. Give the structure of benzyl cation [3.5 marks]