



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**14/16, Ahmadu Bello Way, Victoria Island, Lagos**

**SCHOOL OF SCIENCE & TECHNOLOGY**  
**2013 OCTOBER EXAMINATION**

**Course Code: CHM 305**

**Course Title: Organic Chemistry III**

**Course Unit: 3 Credit Units**

**Time: 2½ Hours**

**Instruction: Answer any five question**

Write the structural formulae of the following compounds

1. i 4-ethyl phenol  
ii Phenyl methanol  
iii 2-methylpropan-2-ol  
iv Ethoxy benzene  
v Tetrahydrofuran  
vi 4-methylbenzoic acid  
vii 3-chloropropanoyl chloride (14 marks)
2. (a) Using THREE relevant examples, discuss the reactions of alcohols involving the R – OH bond cleavage (9 marks)  
(b) State and discuss the Saytzeff's rule. (5 marks)
3. (a) List the methods of preparing ethers. (4 marks)  
(b) Using appropriate examples, discuss the followings in details:  
(i) Williamson Synthesis (5 marks)  
(ii) Oxymecuration-demecuration (5 marks)
4. (a) With the aid of relevant chemical equations discuss briefly the preparation of fatty acids from Grignard's reagent and CO<sub>2</sub>  
(b) Write a short note on the Cannizzaro reaction; given an example.  
(c) How would you convert a carboxylic acid into acid anhydrides?
5. (a)(i) What is hydrolysis? (3 marks)  
(ii) Describe the hydrolysis of ethanamide under acidic and alkaline conditions. (6 marks)  
(b) What are the uses of carboxylic acids? (5 marks)
6. (a) Highlight the similarities and differences between Friedel – Craft acylation and Friedel-craft alkylation reactions. (6 marks)  
(b) Discuss the preparation of ketones from alcohols and give a specific example. (8 marks)

7. (a) Write the structures of :

i)  $\beta$ -fructopyranose

ii) maltose

iii) sucrose

(6 marks)

(b) Discuss briefly the chemical properties of starch  
(4 marks)

(c) State the uses of starch.  
marks)

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