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NATIONAL OPEN UNVERSITY OF NIGERIA PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA FACULTY OF SCIENCES DEPARTMENT OF PURE & APPLIED SCIENCES APRIL/MAY, 2019 EXAMINATIONS

CHM 305-Organic Chemistry III SEMESTER (3 UNITS)
INSTRUCTION: Answer Question 1 and any 4 Questions

TIME: 2 ½ HOURS QUESTION 1

- (a). Show how ethanol can be prepared by hydration of alkene. (9 marks)
- (b). Write short note on preparation of ether using Williamson synthesis (6 marks)
- (c). Using appropriate reagents and catalyst, discuss how aromatic alkanone can be prepared by Friedel-Craft acylation? (3 marks)
- (d). Give the structure of 3-hydroxypropanal and phenylethanal (4 marks)

QUESTION 2

- (a). Explain the process of production of alcohol in large and concentrated quantity from Maize starch. (6 marks)
- (b). Water is more acidic than alcohol discuss. (5 marks)
- (c). Using Lucas test differentiate between primary, secondary and tertiary alcohols. (1 marks)

QUESTION 3

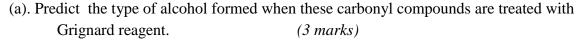
- (a)(i). Differentiate between symmetrical and unsymmetrical ethers. (5 marks)
- (ii). Draw the structure of the following: (4 marks)
 - Oxetane
 - Oxane
 - > Oxalane
 - ➤ 1,4-Dioxane
- (b). Complete the table below: (3 marks)

Formula, IUPAC names, Common names and Sources of Some Carboxylic acids

| Formula | IUPAC Name | Common Name | Source |
|---|-------------------|------------------|-----------------|
| НСООН | Methanoic acid | Formic acid | Vinegar Plant |
| CH ₃ COOH | Ethanoic acid | | Animal Products |
| | Propanoic acid | Propanionic acid | |
| CH ₃ (CH ₂) ₂ COOH | | n-Butyric acid | Rancid butter |
| CH ₃ (CH ₂) ₁₄ COOH | Hexadecanoic acid | | |
| | Octadecanoic acid | Stearic acid | |

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QUESTION 4



- ➤ Aldehyde -----
- **≻** Ketone -----
 - (b). Write short note on Michael nucleophlic addition to α , β -Unsaturated carbonyl compound. Take Benzalacetophenine and ethylmanoate as the Michael donor and acceptor. (9 marks)

QUESTION 5

(a). Write the equation for electrophilic substitution reactions of thiophene with:

H₂SO₄, CH₃COCl and HNO₃. (3 marks)

(b). Give five medicinal/physiological uses of pyridine derivatives. (6 $\frac{1}{2}$ marks)

(1 mark)

- (c). List four industrial uses of Oxalic acid.
- (d). Classify these amino acids into Neutral, Acidic and Basic amino acids.

 $(1 \frac{1}{2} marks)$

- Aspatic and Glutamic acid.
- Glycine and Cystine
- Lysine and Arginine

QUESTION 6

- (a). Discuss the Oxidation and Acylation reactions of glucose. (6 marks)
- (b). Write on the classification of carbohydrate. (6 marks)