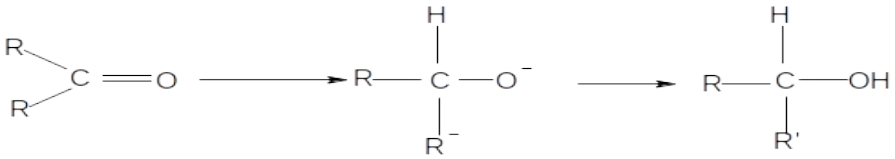
NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MARCH/APRIL 2014 EXAMINATION

COURSE CODE: CHM 305
COURSE TITLE: ORGANIC CHEMISTRY III
TIME ALLOWED: 2 1/2 HOURS
INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER FOUR QUESTIONS

1a) State the condition(s) for the following reaction

i)



ii)

$$CH_3CH_2OH + HCl \longrightarrow CH_3CH_2Cl + H_2O$$

iii)

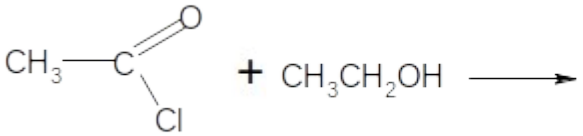
$$CH_2{=}CH_2(g) + H_2O(g) \longrightarrow CH_3CH_2(g)$$

iv)

$$CH_3CH_2CH_2OH \longrightarrow CH_3CH_2CH_2Br + H_3PO_3$$

State the product(s) formed from the following reactions

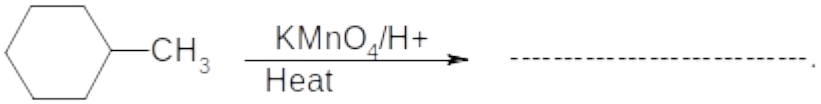
v)



vi)

$$C_2H_5OC_2H_5 + PCl_5 \longrightarrow \text{----------} + \text{----------}.$$

vii)



2a) Differentiate between isomerism and metamerism.

2b) Discuss the general methods of preparing Esters.

2c) Explain transesterification.

3a) Explain the physical properties of aldehydes and ketones.

3b) Discuss the reaction that occurs when ozone is bubbled through a solution of an alkene in 1,1,1-

trichloromethane followed by hydrolysis in the presence of zinc and ethanoic acid.

4a) Discuss the formation of β-Keto esters.

4b) Explain 1,4-nucleophilic Addition using specific reaction.

5a) Classify Heterocyclic Compounds into their main categories.

5b) Discuss the reaction of Thiophene with Organometallic compounds.

5c) State the test for Thiophene.

6a) Discuss the preparation of Pyridine from Pentamethylenediamine hydrochloric acid.

6b) Highlight the physical properties of Pyridine.

6c) Discuss the Nucleophilic substitution of Pyridine.

7a) State the physical characteristics of dicarboxylic acids

7b) Discuss the Preparation of Malonic Esters.