



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS**  
**SEPTEMBER/OCTOBER 2015 EXAMINATION**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

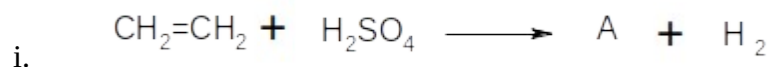
**COURSE CODE:** CHM 305

**COURSE TITLE:** Organic Chemistry III(3 Credit Units)

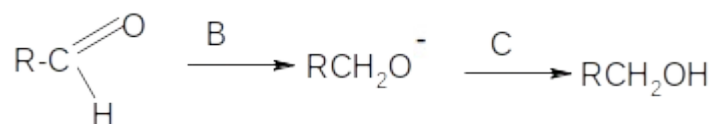
**Time:** 2½ Hours

**INSTRUCTION:** Answer question one and any other four Questions

1a)



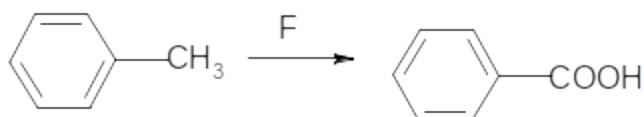
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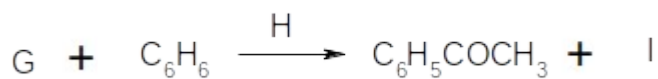
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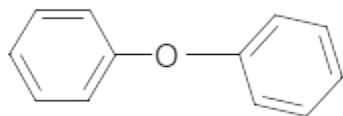
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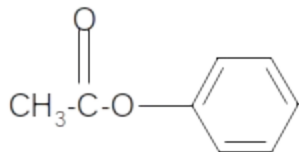
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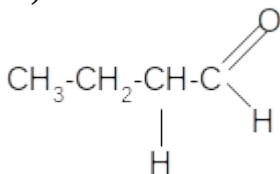
1b) Name the below compounds



i.



ii)



iii)

(14 marks)

2a) Highlight the methods of preparing Aryl chlorides.

2b) Give the products of the below reaction



2c) Give the name of the reaction.

(14 marks)

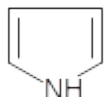
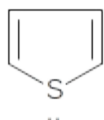
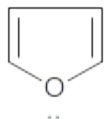
3) Complete the following sentences on carbonyl compounds.

- The two functional groups called carbonyl compounds are \_\_\_\_ (i) \_\_\_\_ and \_\_\_\_ (ii) \_\_\_\_.
- They contain the carbonyl functional group \_\_\_\_ (iii) \_\_\_\_.
- The carbonyl compounds are derivatives of the corresponding alkane with the suffix “ \_\_\_\_ (iv) \_\_\_\_” or “ \_\_\_\_ (v) \_\_\_\_” replacing the “e” from the corresponding alkanes.
- Simple aliphatic carbonyls are \_\_\_\_ (vi) \_\_\_\_ at 20°C.
- Carbonyl compounds boiling points \_\_\_\_ (vii) \_\_\_\_ as the molecules get \_\_\_\_ (viii) \_\_\_\_.
- In terms of polarity, the carbonyl group is \_\_\_\_ (ix) \_\_\_\_.
- The density of simple carbonyl compounds are \_\_\_\_ (x) \_\_\_\_ than that of water.
- Carbonyl compounds with short hydrocarbon chains are \_\_\_\_ (xi) \_\_\_\_ with water.
- Carbonyl compound with carbon atoms of five and above and aromatic compounds are \_\_\_\_ (xii) \_\_\_\_ in water.
- Examples of each carbonyl compounds with two carbon atoms are \_\_\_\_ (xiii) \_\_\_\_ and \_\_\_\_ (xiv) \_\_\_\_.

(14 marks)

4a) Discuss the electrophilic substitution reaction of Furan. (8 marks)

4b) Give the names of the following compounds



( 2marks each x 3 = 6 marks)

5a) Give the classes of Amino acids (6 marks)

5b) Discuss the method of synthesis of  $\alpha$ -amino acids.(8 marks)

(6a) Discuss the preparation of Acetoacetic ester from Claisen Condensation.(7 marks)

(6b) Discuss the physical and chemical properties of Acetoacetic ester. (7 marks)

(7a) Draw the structures of the following compounds. (4 marks)

i) Pyridine    ii) 2,4,6-Collidine    iii) Tetrahydrofurfuryl alcohol    iv) Isoniazide.

(7b) Discuss any three Chemical properties of Pyridine. (10 marks)