



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
14-16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS  
SCHOOL OF SCIENCE & TECHNOLOGY  
JANUARY/FEBRUARY 2013 EXAMINATION**

**CHM 305:                   Organic Chemistry III (3 Credit Units)**

**Time:                               2½ Hours**

**INSTRUCTION:    Answer any five Questions**

**Question 1**

**Cellulose is an important compound in the polymer industry, answer the following question**

**with respect to it:**

- i)       Draw the structure of cellulose. (2 marks)**
- ii)       What are its components.               (2 marks)**
- iii)       State the properties of cellulose. (6 marks)**
- iv)       State the uses of cellulose.               (4 marks)**

**(Total marks for question 1 = 14 marks)**

**Question 2**

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

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

**Question 3**

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

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

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

**Question 4**

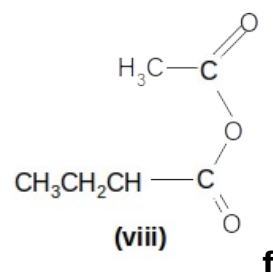
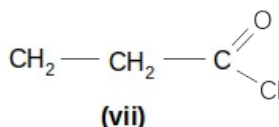
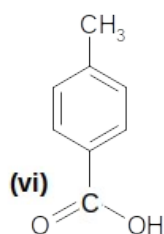
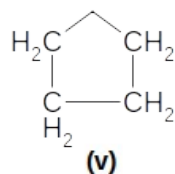
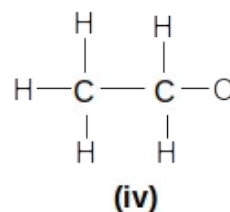
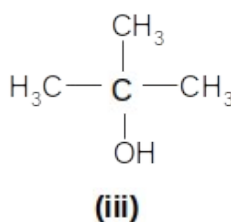
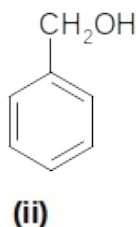
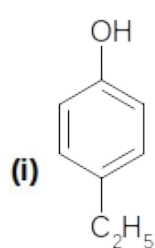
**(a) Describe briefly the Hoffmann Degradation. (4 marks)**

- (b) Illustrate Hofmann Degradation with a typical reaction. (5 marks)  
 (c) State the uses of carboxylic acids and their derivatives. (5 marks)

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### Question 5

- (a) Name the following compounds and state their functional classes.

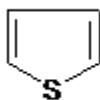


- (b) Write the structural formulae of

- (i) 3-methylbutan-2-ol (ii) 2-phenylethan-1-ol (2 marks)

### Question 6

- (a) Discuss the electrophilic substitution reaction of Furan. (14 marks)  
 (b) Differentiate among the following compounds



( 2 marks each x 3 = 6 marks)

**Question 7**

- (a) Give the classes of Amino acids (10 marks)  
(b) Discuss the method of synthesis of  $\alpha$ -amino acids

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