



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF BIOLOGICAL, PHYSICAL MATHEMATICS AND ACTUARIAL SCIENCES**  
**BACHELOR OF EDUCATION (SCIENCE) WITH IT**  
**UNIVERSITY EXAMINATIONS: 2021/2022 ACADEMIC YEAR**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS**

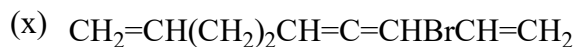
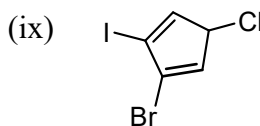
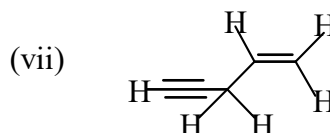
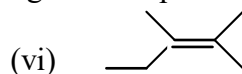
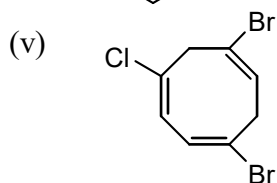
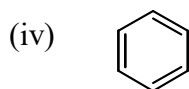
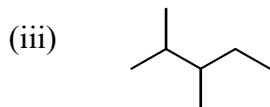
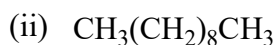
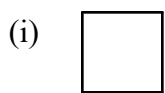
**SCH 103/SPB 9114: BASIC ORGANIC CHEMISTRY SPECIAL/RESIT EXAMINATIONS**

**ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO QUESTIONS IN SECTION B**

**SECTION A: ANSWER ALL QUESTIONS (30 MARKS)**

**QUESTION 1**

(a) Give the IUPAC names of the following organic compounds. (20 marks)



(b) Discuss any **FIVE** features of a homologous series. (10 marks)

## **SECTION B (40 MARKS):**

**ANSWER ANY TWO QUESTIONS FROM THIS SECTION-  
EACH QUESTION CARRIES 20 MARKS**

### **QUESTION 2**

- (a) Give any FOUR uses of alcohols (4 marks)
- (b) Complete the following reactions and name the product(s) (12 marks)
- (i)  $\text{CH}_3-\underset{\text{CH}_3}{\text{C}}=\text{CH}_2 + \text{H}_2\text{O} \xrightarrow[25^\circ\text{C}]{\text{H}^+}$
- (ii)  $\text{C}_{11}\text{H}_{24} \xrightarrow{\text{HEAT}}$
- (iii)  $\begin{array}{c} \text{CH}_3\text{CH}_2 \\ \diagdown \\ \text{C}=\text{C} \\ \diagup \\ \text{CH}_3\text{CH}_2 \end{array} \begin{array}{c} \diagup \\ \text{CH}_3 \\ \diagdown \\ \text{H} \end{array} \xrightarrow[2. \text{Zn}/\text{H}_2\text{O}]{1. \text{O}_3}$
- (iv)  $\text{CH}_3\text{CH}_2\text{OH} + \text{PF}_3$
- (c) Give FOUR uses of alkylhalides (4 marks)

### **QUESTION 3**

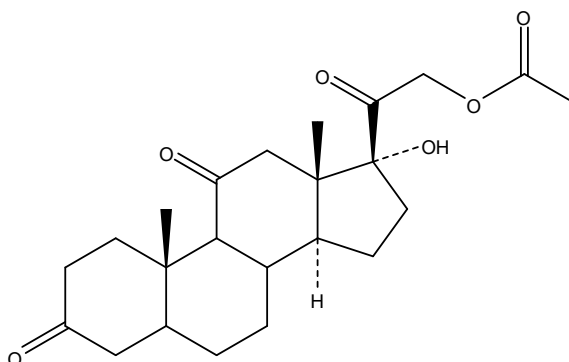
- (a) Give four uses of alkyl halides (4 marks)
- (b) Give two isomers and IUPAC names compounds with the molecular formula  $\text{C}_3\text{H}_8\text{O}$  (4 marks)
- (c) Complete the following reactions by giving structures of the missing reagents/ products: (12 marks)

- (i)  $\text{CH}_3\text{C}\equiv\text{CCH}_3 \xrightarrow{?} \begin{array}{c} \text{H}_3\text{C} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{CH}_3 \end{array} \xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O}} ?$
- (ii)  $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH} \xrightarrow[\text{CCl}_4]{2\text{Cl}_2} ?$
- (iii)  $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH} \xrightarrow[\text{H}_2\text{O}_2]{2\text{HCl}} ?$
- (iv)  $\text{CH}_3\text{C}\equiv\text{CH} \xrightarrow{\text{NaNH}_2/\text{NH}_3} ? \xrightarrow{\text{CH}_3(\text{CH}_2)_5\text{Br}} ?$

### **QUESTION 4**

- (a) Give the mechanism for the following reactions and name the major products; (8 marks)
- (i)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3 + \text{Br}_2 \xrightarrow{\text{H}_2\text{O}}$
- (ii)  $\text{CH}_3-\text{CH}=\text{C}(\text{Br})-\text{CH}_3 + \text{H}-\text{Cl} \longrightarrow$
- (b) Illustrate the three main steps involved in the photochlorination of methane. (6 marks)

- (c) The structure below represents cortisone acetate which is an active ingredient in steroid skin cream. Study it carefully and then circle and name each functional group contained in it. (6 marks)



**QUESTION 5**

- (a) Organic Chemistry is ALL around us. Discuss. (7 marks)
- (b) Comment on the relative stabilities of cyclopropane, cyclobutane, and cyclohexane. (6 marks)
- (c) Explain the meaning of the following terms; (7 marks)
- Electrophiles
  - Nucleophiles
  - Give THREE examples of each in (e) (i) and (ii) above.

***E\*\*\*\*\*N\*\*\*\*\*D***