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CHUKA



UNIVERSITY

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UNIVERSITY EXAMINATIONS

**FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE IN ANIMAL SCIENCE, AGRICULTURE,  
ENVIRONMENTAL SCIENCE, WILDLIFE ENTERPRISE MANAGEMENT,  
HORTICULTURE, NATURAL RESOURCES, FOOD SCIENCE TECHNOLOGY,  
AGRICULTURAL ECONOMICS & AGRICULTURAL EXTENSION**

**CHEM 103: ORGANIC CHEMISTRY**

**STREAMS: BSC (ANSC, AGRIC, ENSC, WIEM, HORT, NARE, FOST, AGEC &  
AGED) TIME: 2 HOURS**

**DAY/DATE: MONDAY 08/4/2019**

**11.30 A.M. – 1.30 P.M.**

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**INSTRUCTIONS:**

- Answer question ONE and any other TWO questions
- Do not write anything on the question paper

**QUESTION ONE (30 MARKS)**

(a) Name the following molecules according to IUPAC system of nomenclature [8 marks]

- (b) Draw the molecular structures of the following molecules [8 marks]
- (i) 2 – methylpentan – 3 – ol
  - (ii) 2 – Chloro – 2 – methylpropane
  - (iii) Cyclohexanamine
  - (iv) 3 – Methylbutanoic acid
  - (v) Hexan – 2 – one
  - (vi) 2 – nitrophenol
  - (vii) Pentan – 1, 3, 4, - triol
  - (viii) (E) – 1 – bromo – 1, 2 – dichloroethene

## CHEM 103

(c) What is the hybridization of each carbon in the following molecules [4 marks]

(d) Giving general equations where applicable, briefly discuss reactions of the following

(i) Ethers [5 marks]

(ii) Aldehydes and ketones [5 marks]

### QUESTION TWO (20 MARKS)

(a) Showing clear mechanisms, describe chlorination of methane [10 marks]

(b) Give five reactions of alcohols (with a general reaction equation in each case) [10 marks]

### QUESTION THREE (20 MARKS)

(a) Discuss heteroatom on a carbon skeleton as a functional group and give four types of compounds that fall on this category [6 marks]

(b) Discuss physical properties of alkanes [6 marks]

(c) Give the reagents and/or condition used in the following reactions [8 marks]

**QUESTION FOUR (20 MARKS)**

- (a) Describe the reduction of alkene [6 marks]
- (b) Briefly discuss hydration of alkynes [7 marks]
- (c) What are the main products of the reactions below [7 marks]

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