



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2009/2010
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE
(FOODS, NUTRITION AND DIETETICS)

HFN 201: ORGANIC CHEMISTRY

DATE: Wednesday 30th December 2009 TIME: 2.00pm – 4.00pm

INSTRUCTIONS: SECTION I: 40 MARKS.

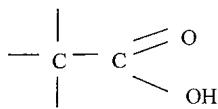
Answer ALL questions in this section

1.
 - i) Differentiate between sigma and pi bonds. [3marks]
 - ii) Consider the following compounds; C_2H_3N and $NaCN$. Which of them is an organic compound and why? [3marks]
 - iii) Illustrate the structural difference between 1° and 2° alcohols. [4marks]

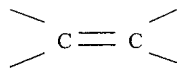
2. Give the IUPAC name of each of the following compounds. (2 mks each x 5 = 10 marks)



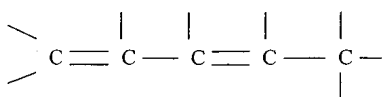
(a)



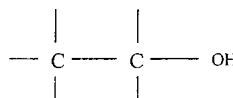
(b)



(c)



(d)



(e)

3.
 - i) Explain which of the following compounds would have a higher boiling point:
 - a) Pentane, 2-methylbutane and 2,2-dimethylpropane (3 marks)
 - b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (4 marks)
 - c) CH_4 and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ (2 marks)
 - ii) List 3 applications of alkanes (3 marks)
 - iii) Explain how carbon atoms are bonded in a benzene molecule (3 marks)
4. An organic compound weighing 94.05g burns completely in air to give 91.96g of carbon dioxide and 18.81g water.
 - a) What is the % composition of carbon, hydrogen and oxygen in the compound? (6 marks)
 - b) What is the empirical formula? (2 marks)
 - c) What is its molecular formula if its molecular weight is 90? (2 marks)

SECTION II: 30 MARKS

INSTRUCTIONS: answer TWO questions only

5. i) Outline the mechanism of reaction when CH_4 reacts with Cl_2 in presence of UV light. (10 marks)
- ii) Explain what is meant by 'optical activity'. (5 marks)
6. i) From your understanding of proteins as functional compounds, explain in details the meaning of the terms α -amino acid, isoelectric point and zwitterions. (10 marks)
- ii) Draw the Fischer projection of D-(+)-glucose and indicate the highest numbered chiral centre. (5 marks)
7. i) Using suitable examples, show how peptide bonds are formed. (5 marks)
- ii) Draw the general structure of a lipid and explain why oils are liquid at room temperature. (10 marks)