KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ENVIRONMENTAL HEATH

HEH 201: ENVIRONMENTAL BIOCHEMISTRY I

DATE: Tuesday 3rd April, 2012 **TIME:** 2.00 p.m. – 4.00 p.m.

SECTION A*: Answer ALL questions (20 marks)*

Q1. a) Outline the various roles of nucleotides in cells. [2 marks]

b) State the significance of the following functional groups in biomolecules [3 marks]

i) sulfhydryl groups

ii) Carboxyl groups

iii) Carbonyl group

Q2. Distinguish between: [5 marks]

i) hemiacetals and hemiketals

ii) ligases and lyases

iii) D- and L-isomers

Q3. Biochemical reactions do conform to basic laws of thermodynamics. Briefly discuss. [4 marks]

Q4. Describe the types of linkages found in carbohydrates. [2 marks]

Q5. Briefly describe the various classes of sphingolipids and state their significance in cells. [4 marks]

SECTION B*: Answer question ONE (compulsory) (20 marks) and any other TWO (15 marks each)*

Q1. a) Briefly explain the significance of Hexose Monophosphate Shunt in specific cell types or tissue metabolism. [3 marks]

b) Explain the various types of enzyme inhibitors. [3 marks]

c) Giving examples where possible, outline the various level of organization of proteins. [2 marks]

d) Discuss the following types of linkages found in biomolecules. [5 marks]

i) ionic interactions

ii) Covalent attachments

iii) Hydrogen bonds

e) Briefly describe the functional ultrastructure of the following celluar structures

i) Mitochondrion

ii) Nucleus [3 marks]

Q2. a) Discuss the various factors that affect enzyme catalysis. [5 marks]

b) Describe the steps involved in TCA cycle and explain why the cycle is crucial in intermediary metabolism. [10 marks]

Q3. a) Discuss the chemiosmotic energy generation theory, as a mechanism of oxidative phosphorylation in cells. [10 marks]

b) Complete oxidation of one molecule of glucose yields about 38 ATP molecules. Briefly account for this. [5 marks]

Q4. a) Discuss the following vitamins with regard to their structure, function and deficiency: [9 marks]

i) Vitamin E

ii) Niacin

iii) Biotin

b) Many poisons inhibit the respiratory chain. Justify, giving examples where possible. [6 marks]

Q5. a) Describe the biosynthetic pathway of purine nucleotides. [10 marks]

b) Give an overview of amino acid catabolism. [5 marks]

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