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**EMBU UNIVERSITY COLLEGE**  
(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)

**FIRST SEMESTER EXAMINATIONS 2013/2014**

**FIRST YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE IN HORTICULTURE/ AGRICULTURE/MANAGEMENT OF AGRO-  
ECOSYSTEM AND ENVIRONMENT**

**ABC 101: BIOCHEMISTRY**

**DATE: NOVEMBER 28, 2013**

**TIME: 2.00 – 4.00PM**

**INSTRUCTIONS:**

**Answer Question ONE and ANY Other TWO Questions.**

**QUESTION ONE (30 marks)**

- a) Define the following terms (4 marks)
- i) Epimers
  - ii) Chirality
- b) List four conditions that lead to protein denaturation (4 marks)
- c) What are the roles of a cofactor to an enzyme activity (3 marks)
- d) List five differences between DNA and RNA (5 marks)
- e) Which are the factors used in regulation of TCA cycle (3 marks)
- f) Define the term buffer and state two factors that determine the effectiveness of a buffer solution (3 marks)
- g) List six characteristics of enzymes (3 marks)
- h) Giving examples, List four biological functions of lipids in the body. (2 marks)
- i) Differentiate starch and glycogen (3 marks)

## QUESTION TWO

Describe the various levels of protein structure organization (20 marks)

## QUESTION THREE

- i.) Describe  $\beta$ -oxidation of 16-carbon saturated fatty acids (15 marks)
- ii.) Using a 16 carbon fatty acid (palmitic acid) as an example, calculate the total energy in ATP yielded from oxidation of even-numbered saturated fatty acids. (5 marks)

## QUESTION FOUR

- i.) a) Using illustrations outline the glycolytic pathway. (10 marks)
- ii.) b) Describe the late limiting steps of this pathway (5 marks)

## QUESTION FIVE

Describe the two major phases involved in the process of photosynthesis in plants. (20 marks)

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