



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

AUGUST – DECEMBER 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF BIOLOGY

REGULAR PROGRAMME

BIO 100: GENERAL BIOLOGY

Date: DECEMBER 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

- Q1. a) 1) Name the two main types of cells and state four ways that they are different from each other **(4 marks)**
- 2) Describe the cell theory **(3 marks)**
- 3) State 6 characteristics that living things possess **(3 marks)**
- b) Explain contributions of Charles Darwin to the theory of evolution **(1 mark)**
- c) 1) Name and describe the three types of passive transport **(3 Marks)**
- 2) Briefly describe how passive transport differs from active transport **(3 marks)**
- d) List 3 life supporting properties of water and explain their importance properties to life **(3 marks)**
- e) Starch, glycogen, cellulose and chitin are polysaccharides, state the function that each is used for and whether it is used by plants or animal. **(4 marks)**
- f) Briefly explain why all organisms need ATP **(1 mark)**
- g) Simple laboratory experiments show that when the enzyme lactase is mixed with lactose, the initial rate of reaction is highest at 48 °C. In food

processing, lactase is used at a much lower temperature, often at 5 °C. Suggest reasons for using lactase at relatively low temperatures

(2 Marks)

- h) Describe what photosynthesis is by stating the three main inputs that are needed for the process to occur and the two main outputs that are produced by the process **(3marks)**
- Q2. When you exercise or perform short bursts of intense activity, you may feel a burning sensation in your muscles. Explain the cause of the burning sensation in your muscles and how is it related to anaerobic respiration **(20 marks)**
- Q3. With the aid of a diagram describe the kranz anatomy and explain the major pathways utilised by plants to fix carbon during the process of photosynthesis **(20 marks)**
- Q4. Discuss 4 of the five kingdoms of organisms **(20 marks)**
- Q5. Enzymes are biological catalysts.
- 1) Relate the chemical structure of an enzyme to its specificity and catalytic activity.
 - 2) Design a quantitative experiment to investigate the influence of pH OR temperature on the activity of the enzyme.
 - 3) Describe what information concerning the structure of an enzyme could be inferred from your experiment **(20 marks)**

END