



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS & ACTUARIAL
SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION
(SCIENCE)
2ND YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: SPB 9212

COURSE TITLE: Biochemistry

DATE:

TIME:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in Section A and ANY other THREE questions in Section B**
- 2. Answers to Questions in Section A and B must be written in the spaces provided on the question paper.**

INSTRUCTIONS: Answer Question 1 and any other TWO questions

QUESTION ONE (Compulsory) (30 marks)

- a) Briefly discuss the mechanism of action of enzymes. [5 marks]
- b) Define the following terms:
(i) Peptide bond
(ii) Vitamins
(iii) Dipolar ions
(iv) Biomolecules
(v) Hormones [10 marks]
- c) Describe any **THREE** properties of amino acids. [3 marks]
- d) What happens when glucose is treated with the following reagents;
(i) HI
(ii) Bromine water
(iii) HNO_3 [6 marks]
- e) Discuss any **THREE** roles of lipids in living things. [6 marks]

QUESTION TWO (20 marks)

- a) Briefly describe the **THREE** classifications of lipids in living organisms. [6 marks]
- b) Give any **FOUR** examples of vitamins that are non-polar encountered in our day to day life. [2 marks]
- c) State any **THREE** examples of disaccharides. [3 marks]
- d) Glucose exist in **TWO** possible cyclic forms. Draw and differentiate between these forms. [4 marks]
- e) Define the term 'glycosidic bond'? [2 marks]
- f) State **THREE** examples of non-essential amino acids [3 marks]

QUESTION THREE (20 marks)

- a) State **FIVE** functions of proteins to a living organism. [5 marks]

- b) Using **TWO** examples of enzymes, state the substrate on which the enzymes act on. [4 marks]
- c) Distinguish between fibrous and globular proteins, give examples in each case. [3 marks]
- d) Classify amino acids into any **THREE** possible ways with suitable examples. [6 marks]
- e) Describe the roles of vitamins in the human body. [2 marks]

QUESTION FOUR (20 marks)

- a) Explain any **THREE** functions of the nucleic acids in living organisms. [6 marks]
- b) What is the structural difference between [12 marks]
- i. a nucleoside and a nucleotide
 - ii. Fats and Oils
 - iii. RNA and DNA
- c) How would you explain the amphoteric behaviour of amino acids? [2 marks]

QUESTION FIVE (20 marks)

- a) Briefly name and describe the **THREE** types of RNA. [6 marks]
- b) Comment on the deficiencies of the following vitamins; [6 marks]
- i. Vitamin K
 - ii. Vitamin B₁₂
 - iii. Vitamin B₂
- c) Define hormones and give any **TWO** examples. [4 marks]
- d) Differentiate between reducing and non-reducing sugars. [4 marks]