



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN POPULATION HEALTH

HPH 203: BIOCHEMISTRY

DATE: 9 /12/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Illustrate the difference between saturated and unsaturated fatty acids (3 marks)
- b) Describe the basic structure of an amino acid and the formation of a peptide bond. (3 marks)
- c) Show the distinction between a nucleotide and a nucleoside (3 marks)
- d) Using Fisher projection of a Glucose molecule as an example, explain D and L configuration of carbohydrates. (3 marks)
- e) Outline three differences between DNA and RNA (3 marks)
- f) Illustrate one exception of the central Dogma theory (3 marks)
- g) Illustrate substrate level phosphorylation in glycolysis (3 marks)
- h) Distinguish between simple and complex lipids (3 marks)
- i) Describe the secondary level proteins (3 marks)
- j) Describe the fermentative pathway of a starch particle in the human (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

- a) Account for a gross 4 ATPs produced during glycolysis and a net of 2 ATPs (10 marks)
- b) Lipids may be classified as either storage or membrane bound. Give a detailed account of the following groups of lipids.
 - i) Triglycerols (5 marks)
 - ii) Phospholipids (5 marks)

QUESTION THREE (20 MARKS)

Discuss the synthesis of a protein starting from a segment of DNA (20 marks)

QUESTIONS FOUR (20 MARKS)

Using relevant structural examples, explain the classification of carbohydrates. (20 marks)

QUESTION FIVE (20 MARKS)

- a) Describe the fermentative pathway of glucose metabolism (10 marks)
- b) Describe the Krebs cycle of glucose metabolism (10 marks)