



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (POPULATION HEALTH

HPH 203: BIOCHEMISTRY

DATE: 11/8/2021

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 fats (3 marks)
- b) Illustrate the formation of a peptide bond (3 marks)
- c) Contrast the structure of a nucleotide and a nucleoside (3 marks)
- d) Explain D and L configuration of carbohydrates using Fisher projections of a Glucose molecule (3 marks)
- e) Illustrate polarity of DNA double strands (3 marks)
- f) Outline three structural differences between DNA and RNA (3 marks)
- g) Illustrate the structural difference between Simple lipids and complex lipids (3 marks)
- h) Distinguish between Catabolism and anabolism (2 marks)
- i) Illustrate the difference between the following:
 - i) Substrate level phosphorylation and oxidative phosphorylation (4 marks)
 - ii) Primary level and secondary level of proteins (3 marks)

SECTION B: (ANSWER ANY OTHER 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) Give a detailed account of the two classes of lipids (10 marks)

QUESTION THREE (20 MARKS)

Discuss semi-conservative DNA replication

QUESTION FOUR (20 MARKS)

Using relevant structural examples, discuss the classification of carbohydrates.

QUESTION FIVE (20 MARKS)

- a) Describe the Krebs cycle of glucose metabolism (10 marks)
- b) Discuss levels of organization of protein structures (10 marks)