



MACHAKOS UNIVERSITY

Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SUPPLEMENTARY EXAMINATION FOR
BACHELOR OF SCIENCE IN ANALYTICAL CHEMISTRY

HPH 203/HEH 201 UNIT NAME: BIOCHEMISTRY

DATE: 15/3/2022

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

Question 1

- i. How are saturated and unsaturated fatty acids different? Illustrate (3 marks)
- ii. Describe the basic structure of an amino acid and the formation of a peptide bond. (3 marks)
- iii. Show the distinction between a nucleotide and a nucleoside (3 marks)
- iv. Using Fisher projection of a Glucose molecule as an example, explain D and L configuration of carbohydrates. (3 marks)
- v. Outline three differences between DNA and RNA (3 marks)
- vi. Distinguish the following terms
 - a) Simple lipids and complex lipids (3 marks)
 - b) Chromatography and Spectrophotometry (3 marks)
 - c) Catabolism and anabolism (3 marks)
 - d) Substrate level phosphorylation and oxidative phosphorylation (3 marks)
 - e) Primary level and secondary level of proteins (3 marks)

SECTION B

Questions 2

- 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.
- a) Triglycerols (5 Marks)
- b) Phospholipids (5 Marks)

Questions 3

Discuss the semi conservative nature of DNA replication (20 Marks)

Questions 4

Using relevant structural examples, explain the classification of carbohydrates. [20 marks]

Questions 5

Account for a gross of 4 ATPs and a net of 2 ATPS during glycolysis [10 marks]

Describe the Krebs cycle of glucose metabolism [10 marks]