



MACHAKOS UNIVERSITY

University Examinations for 2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SUPPLEMENTARY/SPECIAL EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL 205: PRINCIPLES OF BIOCHEMISTRY

DATE: 9/3/2023

TIME : 8.30 – 10.30 AM

INSTRUCTIONS

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

QUESTION ONE (30 MARKS)

- a) Outline six branches of biochemistry (3 Marks)
- b) Draw the structure of maleic acid (*cis*) and fumaric acid (*trans*) (3 Marks)
- c) Briefly explain any three types of lipids (3 Marks)
- d) Explain hydrophobic effect/hydrophobic interactions (3 Marks)
- e) Briefly explain three principal biomolecules studied in biochemistry (3 Marks)

- f) Outline at least three end-products of lipid metabolism (3 Marks)
- g) Explain how carbohydrates are categorized. (3 Marks)
- h) Differentiate anabolic and catabolic reactions (3 Marks)
- i) Explain major components of protein as a biomolecule (3 Marks)
- j) Define purines and pyrimidines (3 Marks)

QUESTION TWO (20 MARKS)

- a) Explain van der Waals interactions and polar solvent (14 Marks)
- b) Draw the Fischer projection(s) of D-Ribose & D-2-Deoxyribose (6 Marks)

QUESTION THREE (20 MARKS)

- a) Define nucleic acids and describe the difference/similarity between DNA and RNA (10 Marks)
- b) Briefly discuss saturated and unsaturated fatty acids (10 Marks)

QUESTIONS FOUR (20 MARKS)

With examples, discuss the role of enzymes, proteins and vitamins in man. (20 Marks)

QUESTIONS FIVE (20 MARKS)

- a) Discuss the classification of amino acids based on nutritional classification (12 Marks)
- b) Briefly discuss six non-protein amino acids (8 Marks)