



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR FIRST SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE IN ANALYTICAL CHEMISTRY

SBC 102/SZL 205: PRINCIPLES OF BIOCHEMISTRY

DATE: 31/1/2022

TIME: 11.00-1.00 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 ONE (30 MARKS)

- | | | |
|----|---|-----------|
| a) | Distinguish between essential and non-essential amino acids | (3 marks) |
| b) | Describe the fate of glycerol in lipid metabolism | (3 marks) |
| c) | Describe the formation of a peptide bond | (3 marks) |
| d) | Explain the significance of glycogenin in glycogen metabolism | (3 marks) |
| e) | Briefly, explain the classes of carbohydrates | (3 marks) |
| f) | Outline the three stages of Beta oxidation of fatty acids | (3 marks) |
| g) | Explain Chargaff's rule | (3 marks) |
| h) | State any three properties of amino acids | (3 marks) |
| i) | Distinguish between competitive and noncompetitive inhibitors | (3 marks) |
| j) | Fat is the chief fuel reserve of the body, justify? | (3 marks) |

SECTION B

QUESTION THREE (20 MARKS)

- a) Discuss the classification of enzymes based on the reactions they catalyze (10 marks)
- b) Describe the reactions leading to the breakdown of glycogen (10 marks)

QUESTION THREE (20 MARKS)

- a) Describe the reactions of glycolysis in living cells (10 marks)
- b) Discuss the classification of lipids (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the hormonal-mediated mobilization of lipids from adipose tissues (10 marks)
- b) Discuss factors that influence the rate of enzyme activity (10 marks)

QUESTION FIVE (20 MARKS)

- a) Describe the features of DNA structure (10 marks)
- b) Discuss the levels of organization of protein structure (10 marks)