

CHUKA



UNIVERSITY

## UNIVERSITY EXAMINATIONS

### EXAMINATION FOR THE AWARD OF DIPLOMA IN AGRICULTURE EDUCATION AND EXTENSION

**BIOC 0113: BASIC BIOCHEMISTRY**

**STREAMS: DIPLOMA AGED**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 16/12/2024  
A.M.**

**8.30 A.M – 10.30**

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#### INSTRUCTIONS:

- *Answer question one and any other two questions.*
- *Do not write on the question paper.*

#### SECTION A

#### QUESTION 1 (30 Mark)

- Give 3 achievements of biochemistry in cell science and medicine. (3 marks)
- Structurally illustrate the formation of cyclic  $\alpha$ -D-glucose and  $\beta$ -D-glucose from a linear form of D-glucose. (4 marks)
- Briefly explain 3 different types of RNA. (3 marks)
- Using examples, differentiate between essential and non-essential amino acids. (4 marks)
- Classify organisms according to their sources of energy (sunlight and chemical compounds) and source of carbon synthesis using examples. (6 marks)
- Outline the 4 differences between RNA and DNA. (4 marks)
- Using examples, differentiate amino acids based on their reaction in solution. (6 marks)

**SECTION B**

- *Answer any two questions*

**QUESTION 2(20 MARKS)**

- a) State three classifications of lipids and give examples of each. (6 marks)
- b) Explain the 4 levels of structural organization of proteins. (8 marks)
- c) Outline 2 ways by which protein can be denatured. (2 marks )
- d) Amino acid molecules can be covalently joined by a peptide bond to form a peptide.  
Illustrate with a diagram the formation of a dipeptide . (4 marks)

**QUESTION 3 (20 MARKS)**

Glycolysis consists of ten successive steps, which are divided into two phases. Discuss the successive steps of glycolysis pathways. (20 marks)

**QUESTION 4 (20 MARKS)**

- a) Explain the electron transport chain. (7 marks)
  - b) State the five integral membrane proteins which are found in the inner mitochondrial membrane. (5 marks)
  - c) Define digestibility of food as used in animal nutrition. (2 marks)
  - d) Discuss 3 factors affecting the digestibility of food in ruminant and non-ruminant animals (6 marks)
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