

CHUKA

UNIVERSITY



UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOCHEMISTRY

BIOC 220: BASIC METABOLISM I

STREAMS:

TIME: 2 HOURS

DAY/DATE: TUESDAY 09/04/2024

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS

- Answer question one and any other two questions

Question 1 (Compulsory) (30 marks)

- Explain the fate of pyruvate in red blood cells. (4 marks)
- Illustrate the Leloir pathway for galactose utilization (8 marks)
- Describe fructose intolerance and associated symptoms. (3 marks)
- Discuss the degradation of glycogen in the skeletal muscles. (6 marks)
- Mention the cause and symptoms of Wernicke-Korsakoff syndrome. (6 marks)
- Outline the role of natural uncouplers in newborn and hibernating animals. (3 marks)

Question two (20 marks)

- Explain how impaired glucose uptake leads to Type I diabetes mellitus. (10 marks)
- Illustrate the Krebs's cycle using biochemical structures. (10 marks)

Question three (20 marks)

- Illustrate the irreversible steps of gluconeogenesis. (8 marks)
- Discuss the steps of the electron transport chain and its coupling with oxidative phosphorylation to produce ATP. (12 marks)

Question four (20 marks)

- a) Explain how products and reactants shift in pentose phosphate pathway depending on the metabolic needs of the participating cell or tissue. (10 marks)
 - b) Discuss both the covalent modification and allosteric regulation of glycogen breakdown. (10 marks)
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