

BIOC 221

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE
IN BIOCHEMISTRY

BIOC 221: BASIC METABOLISM II

STREAMS: BSc. BIOCHEMISTRY Y2 S2

TIME: 2 HOURS

DAY/DATE: MONDAY 20/04/2020

8.30 A.M – 10.30 A.M.

INSTRUCTIONS

- Answer Question One and any other Two Questions
- Do not write anything on the question paper

QUESTION ONE [30 MARKS]

- a. Describe the different ways through which fatty acids can be utilized within the human body. [6 Marks]
- b. Explain how long chain fatty acids are transported to the mitochondria for β -oxidation. [6 Marks]
- c. Explain how nitrogen that accrues in the degradation of amino acids in muscle tissue is transported to the liver. [6 Marks]
- d. Explain how flow through the urea cycle is controlled within the liver lobule. [6 Marks]
- e. Explain the application of asparaginase in the management of leukemia. [6 Marks]

QUESTION TWO [20 MARKS]

- a. Using structural formulae describe the biosynthesis of cholesterol in the body. [10 Marks]
- b. Describe how transcriptional regulation of cholesterol biosynthesis works. [10 Marks]

QUESTION THREE

- a. Humans cannot efficiently utilize carbon contained in fatty acids for gluconeogenesis. However, plants can efficiently do so. Explain. [10 Marks]
- b. Explain the cause, pathogenesis, diagnosis and treatment of phenylketonuria. [10 Marks]

QUESTION FOUR [20 MARKS]

- a. Describe the structure and function of ferritin. [5 Marks]
- b. Explain how heme is degraded in the spleen, and how the degradation product is excreted. [7 Marks]
- c. Explain the rationale and application of phototherapy in newborns experiencing jaundice. [8 Marks]