

**CHUKA UNIVERSITY**

**SECOND YEAR EXAMINATION BIOC 221: BASIC METABOLISM II**

**STREAM: Y2S2 BSc. BIOCHEMISTRY**

**TIME: 2 HOURS**

**INSTRUCTIONS**

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

**Question One (30 marks)**

- a. Describe the different ways through which fatty acids can be utilized within the human body. (6marks)
- b. Explain how fatty acids are transported to the mitochondria for  $\beta$ -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 for the management of leukemia. (6 marks)

**Question Two (20 marks)**

- a. Describe the biosynthesis of cholesterol. (10 marks)
- b. Describe how transcriptional regulation of cholesterol biosynthesis works. (10 marks)

**Question Three (20 marks)**

- 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, and how the degradation product is disposed of. (7 marks)
- c. Explain the rationale and application of phototherapy in newborns experiencing jaundice. (8 marks)