

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
BIOC 220: BASIC METABOLISM**

STREAMS:

TIME: 2 HOURS

DAY/DATE: TUESDAY 30/03/2021

2.30 P.M – 4.30 P.M

INSTRUCTIONS:

Answer question one and any other two questions

QUESTION ONE (COMPULSORY) 30 MARKS

- (a) Describe the role of glycogenin in the synthesis of glycogen. [5 marks]
- (b) Using biochemical structures, illustrate the fate of pyruvate under anaerobic condition. [5 marks]
- (c) Explain the importance of metabolism in living cells. [4 marks]
- (d) (i) Explain the role of the pentose phosphate pathway in formation of glutathione. [2 marks]
- (ii) Explain the role of glutathione in the red blood cells. [3 marks]
- (e) Describe the non cyclic photophosphorylation pathway of the light reactions of photosynthesis. [5 marks]
- (f) Explain the allosteric regulation of glycogen phosphorylase in glycogen breakdown. [6 marks]

QUESTION TWO (20 MARKS)

- (a) Using appropriate biochemical structures, describe how fructose enters the Embden-Meyerhof-parnas (EMP) pathway. [8 marks]

- (b) Describe the electron transport chain and oxidative phosphorylation leading to formation of ATP. [12 marks]

QUESTION THREE (20 MARKS)

- (a) Using appropriate biochemical structures ,describe the Triicarboxylic Acid cycle (TCA) and give its significance. [12 marks]
- (b) Explain the regulation mechanism for phospho fructokinase -1 (PFK-1) in glycolysis. [4 marks]

QUESTION FOUR (20 MARKS)

- (a) Illustrate the irreversible steps of the glycolytic pathway. [7 marks]
- (b) Explain the genetic disorders associated with galactose metabolism. [6 marks]
- (c) With the aid of structural illustrations, describe the oxidative phase of the pentose phosphate pathway. [7 marks]
-