

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION  
RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS  
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN  
BIOCHEMISTRY**

**BIOC 220: BASIC METABOLISM I**

**STREAMS: BIOC**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 10/08/2021**

**8.30 A.M - 10.30 A.M.**

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**INSTRUCTIONS**

- *Answer question ALL questions*

**1. Question 1(30 marks)**

- (a). Explain how glucagon and epinephrine control glycogen metabolism (5 marks)
- (b). Discuss the biochemical basis of galactosemia (5 marks)
- (c). Explain the difference between cyclic and non-cyclic photophosphorylation (5 marks)
- (d)(i) What is the reducing power produced in the pentose phosphate pathway (1 mark)
- (ii) Explain the role of the above reducing power in the synthesis of Glutathione (2 marks)
- (iii) What is the role of glutathione in the cells (2 marks)
- (e). Gluconeogenesis is not the reverse of glycolysis. Justify this statement by illustrating the 4 bypass reactions of gluconeogenesis (5 marks)
- (af). Describe the fate of pyruvate in intense exercise (5 marks)

**2. Question 2 (20 marks)**

- (a). Describe the glyoxylate cycle (10 marks)
- (b). Discuss the Electron transfer chain and the oxidative phosphorylation (10 marks)

**3. Question 3 (20 marks)**

(a) Describe the Citric Acid cycle, indicating the reactions where reducing powers and energy is produced (10 marks)

(b). Describe the glycolytic pathway for glucose clearly indicating steps where ATP is utilized and released (10 marks)

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