

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**FOURTH YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR  
OF SCIENCE IN BIOCHEMISTRY**

**BIOC 423: SPECIAL METABOLISM**

**STREAMS:**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 30/03/2021**

**8.30 A.M – 10.30 A.M**

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**INSTRUCTIONS:**

**Answer question one and any other two questions**

**Do not write on the question paper**

**QUESTION ONE**

- (a) Discuss the structure and functions of eukaryotic flagella axoneme. [5 marks]
- (b) Give three examples of antimetabolic drugs used to inhibit microtubule movement. [3 marks]
- (c) Describe synthesis and inactivation of histamine in the central nervous system. [7 marks]
- (d) Describe 5 types of chemicals that inhibit sodium ion channels. [5 marks]
- (e) Resting membrane potential (RMP) is the membrane potential of a cell that is not producing an electrical signal. Explain how RMP is generated and maintained in the neuron. [10 marks]

**QUESTION TWO (20 MARKS)**

- (a) Discuss the biosynthesis and inactivation of serotonin neurotransmitters. [9 marks]
- (b) Explain why low levels of serotonin in the brain is dangerous. [6 marks]

- (c) Explain the effect of pharmacological agents on GABA minergic neurotransmission. [5 marks]

**QUESTION THREE (20 MARKS)**

- (a) Discuss biochemical basis of hepatic jaundice. [9 marks]  
(b) Using a diagram, show how bilirubin is conjugated in the hepatocytes. [5 marks]  
(c) Explain the rationale and application of phototherapy in newborns. [6 marks]

**QUESTION FOUR (20 MARKS)**

- (a) Discuss the major phases of cardiac action potential. [10 marks]  
(b) Describe energy metabolism during cardiac muscle contraction. [7 marks]  
(c) Explain why cardiac muscles cannot generate tetanic contraction. [3 marks]
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