

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF  
SCIENCE IN BIOCHEMISTRY

**BIOC 423: SPECIAL METABOLISM**

**STREAMS: BSC. BIOC (Y4S2)**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 21/09/2021**

**11.30 A.M. – 1.30 P.M.**

**INSTRUCTIONS:**

- *Answer question one and any other two*

**Question one (30 marks)**

- Explain how receptors control the activity of the target cells. (6 marks)
- List and describe five (5) types of chemicals that inhibit sodium ion channels. (6 marks)
- Describe patch – clamp technique for measuring resting membrane potential. (6 marks)
- Describe synthesis and degradation of GABA (-aminobutyric acid) in the central nervous system. (6 marks)
- Explain why low levels of serotonin in the brain is dangerous. (6 marks)

**Question two (20 marks)**

- Discuss the biosynthesis, inactivation and physiological role of dopamine neurotransmitters. (10 marks)
- Describe the mode of action and physiological role of G-protein coupled receptors. (10 marks)

**Question three (20 marks)**

- Describe the serotonin receptor subtypes of 5HT1 and 5HT2 groups and explain their role in serotonergic transmission. (10 marks)

- b) Explain how resting membrane potential (RMP) is generated and maintained in the neuron. (10 marks)

**Question four (20 marks)**

- a) Describe the role of Calcium ions in the regulation of photo-transduction cascade. (10 marks)
- b) Describe the physiological significance of the following neurotransmitters; (10 marks)
- i. Glutamate
  - ii. Epinephrine  $G\beta_3$
  - iii. Substance p
  - iv. Neurotensin
- .....