

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOMEDICAL SCIENCE AND TECHNOLOGY**

BMET 315: MOLECULAR PHYSIOLOGY

STREAMS: BMET

TIME: 2 HOURS

DAY/DATE: FRIDAY 06/12/2019

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

- Answer question ONE and any TWO questions.
- Do not write on the question paper.

QUESTION ONE (30 MARKS)

- (a) Glutamate is a powerful excitatory neurotransmitter that is released by nerve cells in the brain. Explain the theory of Glutamate excitotoxicity highlighting how hyperammonemia can exacerbate this condition. (8 marks)
- (b) Discuss major sequences of events in synaptic transmission. (5 marks)
- (c) Explain clinical application of anticholinesterase in treating neurological disorders. (4 marks)
- (d) Describe mode of action of the following neurotoxins;
- (i) Fasciculin.
 - (ii) Histriocatoxin
 - (iii) Dendrotoxin
 - (iv) Tetrodotoxin
- (e) Show how 5-hydroxytryptamine, 5-HT is synthesized and inactivated in the neuron. (7 marks)

QUESTION TWO (20 MARKS)

- (a) Discuss mechanism of signal transduction in bacteria chemotaxis. (10 marks)

- (b) Describe five classes of pain. (10 marks)

QUESTION THREE (20 MARKS)

- (a) Discuss regulation of skeletal muscle contraction. (10 marks)
- (b) Describe energy metabolism during muscle contraction. (10 marks)

QUESTION FOUR (20 MARKS)

- (a) Explain how metabotropic receptors differ from ionotropic receptors. (7 marks)
- (b) Explain how malfunctioning of G-protein coupled receptors lead to the following diseases.
- (i) Night blindness (5 marks)
- (ii) Cholera (8 marks)
-