

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: BMED

TIME: 2 HOURS

DAY/DATE: MONDAY 03/12/2018

8.30 AM – 10.30 AM

INSTRUCTIONS:

- **Answer Question One and any other Two Questions**
- **Do not write on the question paper**

QUESTION ONE (30 MARKS)

- (a) Using structural and chemical formulae, describe the formation of bilirubin in the spleen and explain how it is excreted. [7 marks]
- (b) Discuss major sequence of events in synaptic transmission. [7 marks]
- (c) Show how histamine is synthesized and inactivated in the neuron. [8 marks]
- (d) Cholinergic activity can be enhanced by administration of acetylcholinesterase (AChE) inhibitors.
- (i) List four (4) acetylcholinesterase inhibitors. [4 marks]
- (ii) Explain clinical application of anticholinesterase in treating neurodegenerative diseases. [4

marks]

QUESTION TWO (20 MARKS)

- (a) Discuss mechanism of signal transduction in bacteria chemotaxis. [12 marks]
- (b) Explain the role of calcium ions in visual signal recovery. [8 marks]

QUESTION THREE (20 MARKS)

- (a) Discuss regulation of skeletal muscle contraction. [10 marks]
- (b) Describe energy metabolism during muscle contraction. [5 marks]
- (c) Describe the causes of muscle fatigue. [5 marks]

QUESTION FOUR (20 MARKS)

- (a) Describe the mechanism of G-protein signaling. [7 marks]
 - (b) Explain how malfunctioning of G-protein coupled receptors lead to the following diseases.
 - (i) Night blindness. [3 marks]
 - (ii) Hypertension [4 marks]
 - (iii) Cholera [6 marks]
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