

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: THURSDAY 25/03/2021

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- *Answer question one in section A and any other two questions in section B*
- *Do not write anything 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 acetylcholinesterase inhibitors. (4 marks)
 - (ii) Explain clinical application of anticholinesterase in treating neurodegenerative disorders. (4 marks)

QUESTION TWO (20 MARKS)

- (a) Discuss mechanism of signal transduction in bacteria chemotaxis. (12 marks)
- (b) Explain how phototransduction cascade is terminated in the retina. (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) Explain what causes smooth muscle contraction. (5 marks)

QUESTION FOUR (20 MARKS)

- (a) Variety of bacterial toxins exerts their toxic effects (cause diseases) by covalently modifying G-proteins and hence irreversibly modulating their functions. Explain pathological effect of cholera toxin on intestinal epithelium that lead to diarrhea. (10 marks)
 - (b) Compare and contrast ionotropic receptors and metabotropic receptors (10 marks)
-