

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

BIOC 311: BIOMEMBRANES AND BIOSIGNALING

STREAMS: BSC.BIOCHEMISTRY (Y2S1)

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 31/3/2021

11.30 AM – 1.30 PM

INSTRUCTIONS:

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

QUESTION ONE (30 MARKS)

- a) With the aid of a suitable illustration, explain how the lipid bilayer is formed. [5 Marks]
- b) (i). State the molecular changes caused by growth factor signaling. [3 Marks]
(ii). List the type of proteins found in the phospholipid bilayer of the cell membrane. [3 Marks]
- c) Distinguish between antiport and symport transport systems in biomembranes. [5 Marks]
- d) Describe signaling by the receptor tyrosine kinase pathway. [5 Marks]
- e) Describe briefly the signaling pathway triggered by epinephrine and its effect in maintaining blood glucose level. [5 Marks]
- f) Using a nicotinic acetylcholine, describe how ligand gated-ion channel operates.[4 Marks]

QUESTION TWO (20 MARKS)

- a) Explain the CAMP-dependent signaling by G-protein coupled receptors. [10 Marks]
- b) Differentiate between passive diffusion, facilitated diffusion and active transport. [10 Marks]

QUESTION THREE (20 MARKS)

- a) Describe signal transduction by PIP2 clearly indicating the molecular changes caused by the pathway. [10 Marks]
- b) Explain in details the different classes of nuclear receptors. [10 Marks]
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