MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya
Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,
Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2022/2023

THIRD YEAR SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY

SHC 3351: BIOMEMBRANES AND CELLULAR SIGNALING

DATE: AUGUST 2023 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

a) Explain the mechanism of action of sodium pump (3 marks)
b) Describe two general types of endocytosis (3 marks)
c) Outline the common steps in the transport of solute molecules (3 marks)
d) Explain the role of G-proteins in a signalling pathway (4 marks)
e) Describe the structural difference between glycerophospholipids and sphingophospholipids (3 marks)
f) Explain the term Amplification in signal transduction (2 marks)
g) Outline the three main classes of intracellular signalling proteins (3 marks)
h) Explain the behaviour of membrane lipids with aqueous medium (3 marks)
i) Describe the role of calcium-binding proteins in eliciting response (3 marks)
j) Outline the major lipids in mammalian membranes (3 marks)

QUESTION TWO (20 MARKS)

a) Discuss the functions of cAMP in signalling (12 marks)

b) Describe the roles of glycolipids in biomembranes (8 marks)

QUESTION THREE (20 MARKS)

a) Discuss membrane proteins (10 marks)

b) Describe the role of phosphoinositides in cell signalling (10 marks)

QUESTION FOUR (20 MARKS)

a) Discuss ionophores and their role in membrane transport (10 marks)

b) Describe the synthesis and regulation of cGMP (10 marks)