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University Examinations 2023/2024

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

SHC 3351: BIOMEMBRANES AND CELLULAR SIGNALING

DATE: APRIL 2024

TIME: 2 HOURS

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

QUESTION ONE (30 MARKS)

- a) Describe two differences between active and passive transport systems (4 marks)
- b) Explain the 4 patterns of cell communication (4 marks)
- c) Describe receptor-mediated endocytosis (3 marks)
- d) Explain how phagocytosis and pinocytosis are similar and different (2 marks)
- e) Describe how second messengers take part in the signal amplification pathway (3 marks)
- f) Explain the general characteristics of membrane transport systems (3 marks)
- g) Explain briefly two primary factors that influence membrane fluidity (2 marks)
- h) Describe receptor types based on their cellular location (3 marks)
- i) Describe three diseases attributed to abnormalities of membranes (3 marks)
- j) Explain the role of phosphoinositides in cell signalling (3 marks)

QUESTION TWO (20 MARKS)

- a) Describe bio membrane channels (10 marks)
- b) Discuss facilitated diffusion, using glucose transport as an example (10 marks)

QUESTION THREE (20 MARKS)

- a) Discuss G-proteins and their role in cell signalling (10 marks)
- b) Describe non-covalent interactions in the lipid bilayer (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss primary and active mediated transport systems in bio membranes (10 marks)
- b) Discuss the function of CAMP in cell signalling (10 marks)