

# JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY UNIVERSITY EXAMINATIONS 2023/2024

# YEAR 1 SEMESTER 2 EXAMINATION FOR THE MASTER OF SCIENCE IN MOLECULAR MEDICINE

#### TIM 3111: SIGNAL TRANSDUCTION AND PROTEOMICS

**DATE: DECEMBER 2023** 

TIME: 3 HOURS

INSTRUCTIONS: Attempt Any FOUR questions. Each question is 25 Marks

## **Question One**

- a). Describe two (2) ways in which intracellular receptors control cellular activities (10 Marks)
- b). Briefly, describe the structural features of chemically gated ion channels (5 Marks)
- c). Explain how these features are adapted to the functions of the chemically gated ion channels (10 Marks)

#### **Question Two**

- a). Describe the different branches of proteomics (10 Marks)
- b). Using specific examples, discuss how proteomics has been applied in diagnosis of diseases (15 Marks)

#### **Question Three**

Discuss the application of different types of biological networks in medical research (25 Marks)

## **Question Four**

Describe the *In Vitro*, *In Vivo* and *In Silico* techniques for predicting protein-protein interactions (25 Marks)

#### **Question Five**

Compare and contrast signal transduction processing by:

- a). Adenylyl cyclase (12.5 Marks)
- b). Phospholipase C (12.5 Marks)

#### **Question Six**

- a). Describe the types of cell signaling that cytokines use during inflammation (10 Marks)
- b). Explain the mechanism involved in cytokine signaling cascade (15 Marks)

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