



W1-2-60-1-6

**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**

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

**Question Two**

- Describe the different branches of proteomics (10 Marks)
- 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:

- Adenylyl cyclase (12.5 Marks)
- Phospholipase C (12.5 Marks)

**Question Six**

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

