



W1-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2024/2025
EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN MEDICAL
VIROLOGY

TMM 3121: DIAGNOSTIC VIROLOGY & EPIDEMIC SURVEILLANCE & EMERGENCIES

DATE: DECEMBER, 2024

TIME: 3 HOURS

INSTRUCTIONS: Answer Any FOUR Questions (25 Marks each)

Question 1:

Describe the role diagnostic virology and explain its significance in public health with respect to the following:

- a) Importance of laboratory tests in the diagnosis of viral infections [7 marks]
- b) Factors that determine specimen choice for viral diagnosis [at least 3 factors] [6 marks]
- c) Viral Specimen preservation and transportation [8 marks]
- d) Four different approaches utilized in viral diagnosis in the laboratory [4 marks]

Question 2:

- a) What are primary and secondary cell lines and how are they characterized? [10 marks]
- b) Differentiate between cell toxicity and cell viability [7 marks]
- c) Describe possible cell culture contaminants and their effects in biological systems [8 marks]

Question 3: Discuss the evolution of ELISA tests over the last 4 decades with respect to HIV Diagnosis [25 marks]

Question 4:

Discuss the importance of preparedness in responding to outbreaks and emergencies with respect to:

- a) What is viral disease surveillance? (5 Marks)
- b) Discuss the importance of preparedness in responding to outbreaks and emergencies with respect to:
 - i) Key strategies employed in responding to outbreaks [describe at least four] (10 marks)
 - ii) The three primary goals of viral disease surveillance and their implications for public health interventions. (10 marks)

Question 5: molecular methods play an important role in virology

- a) Describe the principle of Polymerase Chain Reaction (PCR) including the key steps involved. (10 marks)
- b) Describe the advantages of using PCR over traditional diagnostic methods [3 marks]
- c) List the 6 main components required for a successful PCR reaction and briefly describe the function of each component. (12 marks)

Question 6: Discuss the risk factors associated with outbreaks following disasters and the interventions that can be implemented under the following sub-questions:

- a) Identify and explain five key risk factors for outbreaks after disasters. (10 marks)
- b) Discuss three interventions that can effectively prevent or control viral infections during disasters, providing justification for each. (15 marks)