



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2024/2025

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF MASTERS IN
EPIDEMIOLOGY

HPE 7115: EPIDEMIOLOGIC METHODS FOR THE STUDY OF INFECTIOUS DISEASES

DATE: DECEMBER 2024

TIME: 3 HOURS

INSTRUCTIONS:

Answer Question one and any other three Questions

QUESTION ONE (30 MARKS)

- Briefly describe how interrupted time series analysis can be used to evaluate the effectiveness of an infectious disease control intervention (4 marks)
- Outline the key challenges in integrating social and behavioral data into infectious disease surveillance (4 Marks)
- Describe four best practices for communicating epidemiological data to policymakers (4 Marks)
- Describe in brief how real-time data integration improve the management of infectious disease outbreaks (6 Marks)
- Describe how storytelling techniques in epidemiology communicate the urgency of an outbreak to the general public (4 Marks)
- Discuss briefly how genomic data be used (o understand the transmission dynamics of infectious diseases (4 Marks)
- Describe the role of predictive modeling in early outbreak detection (4 Marks).

QUESTION TWO (15 MARKS)

- Describe the process of designing a mathematical model to understand the spread of an infectious diseases (4 marks)
- Outline key factors that should be considered, and how you would you use the model in (a) above to predict future outbreaks (5marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

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QUESTION THREE (15 MARKS)

- a) Describe how real-time surveillance systems and data integration techniques can improve the monitoring and control of infectious disease outbreaks (10 Marks).
- b) Outline the benefits and challenges associated with using these systems (5 Marks)

QUESTION FOUR (15 MARKS)

- a) Evaluate the use of propensity score matching in observational studies of infectious disease interventions.
- b) Describe the strengths and limitations of this method, and how it can be used to confounding biases?

