



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2023/2024

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF PUBLIC HEALTH, THIRD YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LAB SCIENCE

### HPP 3122: PRINCIPLES OF EPIDEMIOLOGY

### HML 3324: EPIDEMIOLOGY AND DISEASE SURVEILLANCE

DATE: APRIL 2024

TIME: 2 HOURS

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#### INSTRUCTIONS:

1. Answer Question ONE, and any other TWO
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#### QUESTION ONE (30 Marks)

1. i) Distinguish between morbidity rate and mortality rate (4 Marks)  
ii) Using diagrams, describe the relationship between incidence and prevalence rates (6 Marks)
  2. Briefly discuss the natural history of diseases under the following sub-headings
    - a) Timeline of diseases (use a diagram) (4 marks)
    - b) Measures of diseases prognosis (4marks)
  3. In a population of 50,000 people, the prevalence of malaria as determined by blood smear is 10%. A new rapid test is developed to test malaria and its results indicate that 3000 people have malarial and it picks out that 40,000 are not infected.
    - i) Show a 2 by 2 table with the above information. (2 Marks)
    - ii) Calculate the positive predictive value of the new test. (3 Marks)
    - iii) Calculate the negative predictive value of the new test. (3Marks)
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iv) Describe briefly the importance of false positive and false negative results from screening and diagnostics tests (4 Marks)

**QUESTION TWO (20 MARKS)**

Discuss the contribution of Ignaz and John Snow to modern day epidemiology and public health practices.

**QUESTION THREE (20 MARKS)**

Discuss epidemiology study designs citing their advantages and disadvantages

**QUESTION FOUR (20 MARKS)**

In African Country X with a population of 1 million people, there were 300,000 children under five years. 50,000 deaths occurred in the year 2005. At this time, 20,000 people were infected by cholera and 10,000 of the infected people had died and of these, 3000 were under five years of age. Calculate the following.

- i. Prevalence rate of cholera in 2005. (3 Marks)
- ii. Case fatality of cholera in 2005. (3 Marks)
- iii. Under 5 mortality rate. (3 Marks)
- iv. Crude death rate in 2005. (3 Marks)
- v. Proportionate mortality ratio. (3 Marks)
- vi. When insulin, used in the management of diabetes, first become introduced, the prevalence of diabetes increased. Expound briefly on this paradoxical statement. (5 Marks)

