



“Investing in Africa’s Future”

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

NSHS 203: INTRODUCTION TO EPIDEMIOLOGY AND BIostatISTICS

END OF SECOND SEMESTER EXAMINATIONS

MAY/JUNE 2022

LECTURER: MR. E. CHIKAKA

DURATION: 3 HOURS

INSTRUCTIONS

ANSWER **ALL** QUESTIONS FROM SECTION A AND **ANY THREE (3)** FROM SECTION B

THE MARK ALLOCATION FOR EACH QUESTION IS INDICATED AT THE END OF THE QUESTION

CREDIT WILL BE GIVEN FOR LOGICAL, SYSTEMATIC AND NEAT PRESENTATION

SECTION A [40 MARKS]

QUESTION 1

- a. What do you understand by epidemiology and what are its function and uses in public health? [5]
- b. Are the following nominal, ordinal, interval or ratio data? Explain your answers.
 - (i) Temperatures measured on the Kelvin scale.
 - (ii) Police ranks.
 - (iii) National Social Security numbers.
 - (iv) Number of passengers on buses from Harare to Mutare.
 - (v) Code numbers given to the religion of persons attempting suicide. [5]

QUESTION 2

What do you understand by disease transmission? Explain with an example the epidemiologic triad, the mode of transmission, chain of infection and how one can stop the transmission. [10]

QUESTION 3

- a. Identify the core epidemiology functions [5]
- b. Describe the primary applications of epidemiology in public health practice [5]

QUESTION 4

A sample of 10 individuals is selected for participation in a study of cardiovascular risk factors. The following data represent the ages of the enrolled individuals measured in years (continuous variable). The data are as follows:

85 83 82 79 77 76 73 63 68 75

- (i) Find the sample mean, standard deviation and standard error of the mean. Interpret the standard deviation of the mean [8]
- (ii) Explain when you would use the median instead of the mean as a measure of central tendency? [2]

SECTION B [60 MARKS]

QUESTION 5

- a. Explain what is meant by validity and reliability of analytic tests (screening and analytic tests) and how one can check for them. [10]
- b. How does epidemiology function in your area of specialisation? [5]
- c. Why is epidemiology the core science of public health? [5]

QUESTION 6

A mammogram detects 300 positives for breast cancer, of which 170 are incorrect, and 700 negatives, of which 80 are incorrect.

- i. Construct a 2 x 2 table to measure the diagnostic performance of a mammogram for breast cancer [4]

TEST	CANCER	NO CANCER	TOTAL
+			
-			
TOTAL			

- ii. What is the sensitivity, specificity of the mammogram [4]
iii. What is the false positive and false negative rate? [4]
iv. What is the positive and negative predictive value? [4]
v. What is the accuracy of the mammogram? [4]

QUESTION 7

- a. What are the guidelines for judging whether an association between exposure and outcome is causal? Give an example of each. [10]
b. Describe the processes, uses, and evaluation of public health surveillance. [10]

QUESTION 8

- a. List and explain all the steps one need to take in the investigation of an outbreak [10]
b. What is the Covid-19 response and investigation structure like in health care facilities in your country? Include how you report a case that has been identified from the village level to the hospital/ clinic, staff involved, their roles and what they do. [10]