"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

NSHS 203: INTRODUCTION TO EPIDEMIOLOGY AND BIOSTATISTICS

END OF SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS

AUGUST 2021

LECTURER: MR. E. CHIKAKA

DURATION: 7 HOURS

INSTRUCTIONS

ANSWER **ANY ONE** QUESTION

PLEASE STICK TO THE STANDARD HOUSE STYLE i.e.

- TIMES NEW ROMAN
- FONT SIZE 12
- DOUBLE SPACING
- APA REFERENCING
- SEND YOUR ANSWER AS A PDF DOCUMENT

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

CREDIT WILL BE GIVEN FOR LOGICAL, SYSTEMATIC AND NEAT PRESENTATION

QUESTION 1

a. Define epidemiology and identify its function and uses. [10]
b. Summarize the historical evolution of epidemiology [10]
c. List and explain the key features and uses of :
   i. Descriptive epidemiology [5]
   ii. Analytic epidemiology [5]
   iii. What do measures of central tendency and variation indicate? Describe the important measures of central tendency and variation pointing out the situation when one measure is considered relatively appropriate in comparison to other measures. [10]
d. The following are the number of students absent from a college on 24 consecutive days: 29, 25, 31, 28, 30, 28, 33, 31, 35, 29, 31, 33, 35, 28, 36, 30, 33, 26, 30, 28, 32, 31, 38 and 27.
   i. Calculate range, IQR, mean, mode, median, variance, standard deviation and standard error of these data. [15]
   ii. Calculate the 95% confidence interval around the mean and interpret it [5]

e. Distinguish with examples the different types of scales of measurement and how each type is presented. [10]
f. Describe the processes, uses, and evaluation of public health surveillance. [10]
g. List and explain all the steps one needs to take in the investigation of an outbreak [10]

QUESTION 2

a. 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]
b. What are the FUNCTIONS of Epidemiology in public health? [5]
c. Who are the main contributors to modern day epidemiology and why? [10]
d. Define and describe the three essential characteristics of disease that we look for in:
i. descriptive studies.
ii. analytic studies [10]
e. What are the measures of public health impact and how are they measured?[10]
f. Discuss any three different study designs used in epidemiology [10]
g. List and explain all the data sources and data types you know [10]
h. What do measures of central tendency and variation indicate? Describe the important measures of central tendency and variation pointing out the situation when one measure is considered relatively appropriate in comparison to other measures. Show how each measure is calculated [15]
i. Distinguish with examples the different types of scales of measurement and how each type is presented. [10]
j. Define public health surveillance and list the essential activities and desirable characteristics of well-conducted surveillance activities [10]

QUESTION 3

a. 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. [20]
b. Identify the core epidemiology functions [5]
c. Describe the primary applications of epidemiology in public health practice [5]
d. What are the guidelines for judging whether an association between exposure and outcome is causal? Give an example of each. [10]
e. Distinguish with examples the different types of scales of measurement and how each type is presented. [10]
f. 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. [10]

f. 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 yeas (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]

h. Explain validity and reliability of analytic tests (screening and analytic tests) and how one can check for them. [10]
i. A mammogram detects 350 positives for breast cancer, of which 110 are incorrect, and 750 negatives, of which 180 are incorrect.
k. 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]