



**PAMIBIA UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

**FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES**  
**SCHOOL OF HEALTH SCIENCES**  
**DEPARTMENT OF CLINICAL HEALTH SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF HUMAN NUTRITION ,BACHELOR OF HEALTH INFORMATION SYSTEMS MANAGEMENT, BACHELOR OF ENVIRONMENTAL SCIENCES, BACHELOR OF BIOMEDICAL SCIENCES	
<b>QUALIFICATION CODE:</b> 07BHIS, 07BSHM, 08BMLS, 08BOHN,08BOHS	<b>NQF LEVEL:</b> 5
<b>COURSE NAME:</b> HEALTH SCIENCE STATISTICS	<b>COURSE CODE:</b> HSS511S
<b>SESSION:</b> JUNE 2023	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER</b>	MR JJ SWARTZ AND MR SP KASHIHALWA
<b>MODERATOR:</b>	DR L AKU-AKAI

<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Answer ALL the questions in the booklet provided.</li><li>2. Show clearly all the steps used in the calculations.</li><li>3. All written work must be done in blue or black ink and sketches must be done in pencil.</li></ol>

**PERMISSIBLE MATERIALS**

1. Non-programmable calculator without a cover.

**THIS QUESTION PAPER CONSISTS OF 5 PAGES** (Including this front page).

**QUESTION 1 [20 MARKS]**

**Write down the letter corresponding to the best answer for each question.**

- 1.1 If event A and event B are mutually exclusive and collectively exhaustive, what is the  $P(A \cup B)$  time? [2]
- A. 0.10
  - B. 0.50
  - C. 1.00
  - D. 1.01
- 1.2 A stem and leaf plot allows you to: [2]
- A. Detect difference between qualitative and quantitative.
  - B. Detect distributional pattern of the data.
  - C. Remove outliers.
  - D. Positively skewed.
- 1.3 Which of the following is the same as the median [2]
- A. Mode
  - B. Central measure of tendency
  - C.  $Q_2$
  - D. Mediane
- 1.4 If the probability of experiencing adverse event after COVID-19 vaccine is 0.2. What type of probability distribution can be used to find that the next 12 vaccinated individual will have no adverse event? [2]
- A. Uniform distribution
  - B. Binomial distribution
  - C. Poisson distribution
  - D. Normal distribution

- 1.5 The amount or degree of spread is known as: [2]
- A. Variety
  - B. Mid-spread
  - C. Variation
  - D. Variable
- 1.6 A patient is chosen at random from a group of 5 who suffer from diabetes and 20 who suffer from cancer. What is the probability that the patient chosen suffer from cancer? [2]
- A. 0.8                      B. 0.20                      C. 0.50                      D. 0
- 1.7 The measure of dispersion will never be: [2]
- A. Zero
  - B. Negative
  - C. Spread out
  - D. Equal to 50%
- 1.8 Measures of dispersion include: [2]
- A. mean, range and skewness
  - B. mean, median, mode and range
  - C. range, variance and standard deviation
  - D. mean, median, mode and variance
- 1.9 The more data are spread out the greater the: [2]
- A. Mean, Mode and range
  - B. Range, Standard deviation and Variance
  - C. Mean, Mode and Variance
  - D. B&C
- 1.10 Which of the following is a measure of dispersion: [2]
- A. Average
  - B. Range
  - C. Median
  - D. Variance

**QUESTION 2 [26 MARKS]**

2.1 Consider a survey of nurses' opinions of their working conditions. What types of variables are (Indicates if they are qualitative or quantitative and if they are continuous or discrete):

- a) Length of service [2]
- b) Staff grade [1]
- c) Age [2]
- d) Salary [2]
- e) Number of patients seen in a day [1]
- f) Possession of a degree [1]

2.2 The following data gives the number of COVID-19 cases detected in the 11 regions.

40	25	25	25	26	28	29	50	50	51	51
----	----	----	----	----	----	----	----	----	----	----

- 2.2.1 Calculate the average, median and mode and interpret your answer [7]
- 2.2.2 Compute the variation and standard deviation [5]
- 2.2.3 Construct an ordered stem and leaf for the number of COVID-19 cases [5]

**Question 3 [26 MARKS]**

3.1 The Ministry of Health and Social Services gets 60% of it is COVID-19 vaccines from a manufacturer in China and the remainder from a manufacturer in Russia. The quality of the COVID-19 delivered is given below.

Manufactures	% Of non-defective vaccines	% of defective vaccines
China	97	3
Russia	93	7

- 3.1.1 Find the probability of receiving a defective vaccine [8]
- 3.1.2 Find the probability that a randomly chosen vaccine comes from a Manufacturer in China and it is defective [3]

3.2 Suppose 100 General practitioner were asked whether they are in favour of or against taking COVID-19 booster shot. The table below summarised their opinion: Use  $M = \text{Male}$ ,  $F = \text{Female}$ ,  $I = \text{In-favour}$ ,  $A = \text{against}$

	In-favour	Against	Total
Male	15	45	60
Female	4	36	40
<b>Total</b>	19	81	100

- 3.2.1 Show that event female and in-favour are independent or not [3]  
 3.2.2 Find  $P(\text{in-favour}/\text{Male})$  [4]  
 3.2.3 Find  $P(\text{in-favour} \cup \text{Male})$  [4]  
 3.2.4 Find  $P(\text{against}/\text{female})$  [4]

**Question 4[28 MARKS]**

4.1 A Clinician is interested in detecting COVID-19 vaccines adverse event, the Clinician observed 20 people to have adverse event in a total of 100 people observed. If the clinician observed 12 vaccinated people today, what is the probability of :

- 4.1.1 Observing no adverse event [2]  
 4.1.2 Observing at most two adverse events [4]  
 4.1.3 Observing at least four adverse event [4]  
 4.1.4 Observing exactly two adverse event [2]  
 4.1.5 Find the average number of adverse event [2]

4.2 A dietician knows that an individual suffering from malnutrition is assumed to have an average of three balanced meals per day

- 4.2.1 What is the probability that an individual suffering from malnutrition receive no balanced meals per day [2]  
 4.2.2 What is the probability that an individual suffering from malnutrition receive at least 3 meals per day [5]  
 4.2.3 What is the probabilities that an individual suffering from malnutrition receive at least 2 meals per day [5]  
 4.2.4 What is the probability that an individual suffering from malnutrition receive 1 meal per day [2]

**END**