



**PAMIBIA UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

**FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES**

**DEPARTMENT OF HEALTH SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF SCIENCE IN HEALTH INFORMATION SYSTEMS MANAGEMENT	
<b>QUALIFICATION CODE:</b> 07BHIS	<b>LEVEL:</b> 7
<b>COURSE:</b> BIostatISTICS AND DEMOGRAPHY	<b>COURSE CODE:</b> BSD721S
<b>SESSION:</b> JUNE 2022	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER</b>	Dr Jacob Ong'ala
<b>MODERATOR</b>	Prof Lillian Pazvakawambwa

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

**PERMISSIBLE MATERIALS**

Scientific Calculator

**THIS QUESTION PAPER CONSISTS OF 4 PAGES** (including this front page)

**QUESTION ONE - 20 MARKS**

- (a) Describe 4 sources of data in health sector. [4 mks]
- (b) Indicate whether each of the following variables is quantitative or qualitative. State its measurement scale. (example of data is shown in the bracket) [6 mks]

	Variable	Qualitative/Quantitative	Measurement scale
a	Height (short, tall medium)		
b	Weight (37kg, 74Kg, 300g)		
c	Names (Jane, Grace, Ben)		
d	No. of cars passing a junction (23, 5, 86)		
e	Temperature (13°C, 49°C, 0.74°C)		
f	Year of birth (1982, 2001, 1988)		

- (c) Represent the following data set (Height of male soldier) in a frequency table by using 8 classes [8mks]

60; 60.5; 61; 61; 61.5; 63.5; 63.5; 63.5; 64; 64; 64; 64; 64; 64; 64; 64; 64.5;  
 64.5; 64.5; 64.5; 64.5; 64.5; 64.5; 64.5; 66; 66; 66; 66; 66; 66; 66; 66; 66;  
 66; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 66.5; 67; 67; 67;  
 67; 67; 67; 67; 67; 67; 67; 67; 67.5; 67.5; 67.5; 67.5; 67.5; 67.5;  
 68; 68; 69; 69; 69; 69; 69; 69; 69; 69; 69.5; 69.5; 69.5; 69.5;  
 70; 70; 70; 70; 70; 70; 70.5; 70.5; 70.5; 71; 71; 71; 72; 72; 72; 72.5; 72.5;  
 73; 73.5; 74

- (d) Differentiate between a sample and a population [2 mks]

**QUESTION TWO - 20 MARKS**

Mark recently opened a sports, health and fitness center in his town. In just the first week, he has already gained 148 regular customers, 87 of which are male and 61 of which are female. To get feedback on the products and services that his store is offering, he decided to conduct a customer survey. Taking gender into account, Mark asked his customers about their satisfaction level with his products and services. The answer options were unsatisfied, satisfied, and unsure. There were 25 unsatisfied, 12 unsure and 50 satisfied male customers. There were 5 unsatisfied, 20 unsure and 36 satisfied females customers. In total, there are 30 unsatisfied, 32 unsure and 86 satisfied customers.

- (a) For this given scenario, create a contingency table showing the given data using cross tabulation. The table should focus on two variables (gender and satisfaction level). [7 mks]
- (b) Is there any data that can be classified as categorical data? [2 mks]
- (c) What can you say about the total number of satisfied versus unsatisfied customers? Is Mark's business doing well in its first week of operation? [2 mks]
- (d) What will happen if the number of unsatisfied customers were greater than the number of satisfied customers? What should Mark do to lessen the dissatisfaction level? [2mks]

- (e) Draw a grouped bar graph to represent Mark's data (Use level of satisfaction in x- axis). [7mks]

**QUESTION THREE - 20 MARKS**

- (a) Trudy Green works for the True-Green Lawn Company. Her job is to solicit lawn-care business via the telephone. Listed below are the numbers of appointments she made in each of the last 25 hours of calling.

5, 4, 2, 7, 6, 8, 5, 4, 6, 4, 4, 5, 4, 5, 7, 4, 2, 8, 3, 3, 6, 3, 3  
Calculate the following

- (a) Range [1mks]
- (b) Mode [1mks]
- (c) Median [1mks]
- (d) Arithmetic mean [3mks]
- (e) Variance [6mks]
- (f) Standard Deviation [5mks]
- (g) coefficient of variation. [3mks]

**QUESTION FOUR - 20 MARKS**

The city council of Windhoek is considering increasing the number of police in an effort to reduce crime. Before making a final decision, the council asks the Chief of Police to survey other cities of similar size to determine the relationship between the number of police and the number of crimes reported. The Chief gathered the following sample information.

City	No of police (X)	No. of Crime (Y)
Oxford	15	17
Starksville	17	13
Danville	25	5
Athens	27	7
Holgate	17	7
Carey	12	21
Whistler	11	19
Woodville	22	6

- (a) Draw a scatter plot [4mks]
- (b) Interpret results in (a) above [2mks]
- (c) Find the correlation coefficient r [8mks]
- (d) Fit a regression model for the data [6mks]
- (e) Use the regression model above to find Y when X=30. [2mks]

**QUESTION FIVE - 20 MARKS**

The following tables shows the Populations and deaths in Georgia in 2000 and the United States census in 2000.

**Population/Deaths for Georgia, 2000,**

Age (Years)	Population <sup>a</sup>	Deaths <sup>a</sup>
0-4	595,150	1,299
5-9	615,584	101
10-14	607,759	136
15-19	596,277	447
20-44	3,244,960	5,185
45-64	1,741,448	13,092
65 and over	785,275	43,397

**Population of the United States, 2000**

Age (Years)	Population
0-4	19,175,798
5-9	20,549,505
10-14	20,528,072
15-19	20,219,890
20-44	104,004,252
45-64	61,952,636
65 and over	34,991,753

- (a) Obtain an Crude death rate for Georgia in 2000 [6mks]
- (b) Obtain an age-adjusted death rate for Georgia by using the 2000 United States census as the standard population. [14mks]