



**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> JULY 2022	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>SUPPLEMENTARY/SECOND 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) A case-control study was undertaken to identify reasons for the exceptionally high rate of lung cancer among male residents of Windhoek. (*The exposure under investigation, "shipbuilding," refers to employment in shipyards during World War II.*) . Data are tabulated separately for smokers and nonsmokers in the table below. Use it to answer the following;

Smoking	Shipbuilding	Cases	Controls
No	Yes	11	35
	No	50	203
Yes	Yes	84	45
	No	313	270

- (i) Find the proportion smoking controls with exposure [2mks]  
 (ii) Find the proportion smoking cases with exposure [2mks]  
 (iii) Find the proportion non-smoking cases without exposure [2mks]  
 (iv) Find the proportion non-smoking cases with exposure [2mks]
- (b) The following set of data represent the added cost of rent per unit for 40 units in an estate. Construct Cumulative frequency table of 7 classes. [8mks]

165	186	122	172	140
153	208	169	156	114
113	135	131	125	177
136	136	127	112	188
171	179	152	155	116
90	187	136	159	97
141	85	91	170	111
147	165	163	159	150

- (c) Indicate whether each of the following variables is quantitative or qualitative. State its measurement scale. (example of data is shown in the bracket) [4 mks]

	Variable	Qualitative/Quantitative	Measurement scale
a	Height (short, tall medium)		
b	Weight (37kg, 74Kg, 300g)		
c	Names (Jane, Grace, Ben)		
d	Temperature (13°C, 49°C, 0.74°C)		

**QUESTION TWO - 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]

**QUESTION THREE - 20 MARKS**

The weights (in pounds) of 57 children at a day-care centre are as follows. Use it to compute the following quantities

Weight interval	Frequency, <i>f</i>
10-19	5
20-29	19
30-39	10
40-49	13
50-59	4
60-69	4
70-79	2
Total	57

(a) Mode [3 mks]

(b) Medium [4 mks]

(c) Mean [5 mks]

(d) Standard Deviation [6mks]

(e) coefficient of variation. [2mks]

**QUESTION FOUR - 20 MARKS**

The data in the table below shows the values for the birth weight (*x*, in ounces) and the increase in weight between days 70 and 100 of life, expressed as a percentage of the birth weight (*y*) for 12 infants.

$x$	$y$
112	63
111	66
107	72
119	52
92	75
80	118
81	120
84	114
118	42
106	72
103	90
94	91

- (a) Draw a scatter plot [4mks]
- (b) Interpret results in (a) above [2mks]
- (c) Find the correlation coefficient  $r$  [6 mks]
- (d) Fit a regression model for the data [6mks]
- (e) Use the regression model above to predict the increase between days 70 and 100 of life if the birth weight is 95 oz. would be. [2mks]

**QUESTION FIVE - 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 the 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]