NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS

QUALIFICATION:	BACHELOR OF PROPERTY STUDIES/NATIONAL DIPLOMA IN PROPERTY STUDIES/GEOMATICS		
QUALIFICATION CODE:	27DPRS, 27DLMR, 27DLAD, 27BPRS	**LEVEL:**	5
COURSE CODE:	MSS501S	**COURSE NAME:**	MATHEMATICS AND STATISTICS FOR SPATIAL SCIENCES
SESSION:	JULY 2022	**PAPER:**	THEORY
DURATION:	3 HOURS	**MARKS**	100

SUPPLEMENTARY/ 2ND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER	Dr. Jacob Ong'ala
MODERATOR	Mr.Andrew Roux

INSTRUCTION

1. Answer all the questions
2. Show clearly all the steps in the calculations
3. All written work must be done in blue and black ink
4. You may refer to your notes or any other materials

PERMISSIBLE MATERIALS

Non-programmable calculator without cover

THIS QUESTION PAPER CONSISTS OF 5 PAGERS (including the front page)

SECTION A

QUESTION 1 - 16 MARKS

(a) Evaluate the following expressions

(i) $\dfrac{3+\sqrt{(5^2-3^2)}+2^3}{1+(4\times 6)\div(3\times 4)}+\dfrac{15\div 3+2\times 7-1}{3\times\sqrt{4}+8-3^2+1}$ **[5 mks]**

(ii) $2\frac{1}{2}-\left(\frac{2}{5}+\frac{3}{4}\right)\left(\frac{5}{8}\times\frac{2}{3}\right)$ **[3 mks]**

(b) Simplify the following expressions completely

(i) $[(s+2t)-(s+3t)]-[(2s+3t)-(-4s+5t)]$ **[3 mks]**

(ii) $(a^2\sqrt{b}\sqrt{c^3})(\sqrt{a}\sqrt[3]{b^2c^5})$ **[3 mks]**

(c) A training college has 480 students of which 150 are girls. Express this as a fraction in its simplest form. **[2 mks]**

QUESTION 2 - 13 MARKS

(a) Factorise $x^2+2x-15$ **[3 mks]**

(b) Solve for f

$\frac{1}{5}(2f-3)+\frac{1}{6}(f-4)+\frac{2}{15}=0$ **[4 mks]**

(c) Use completing the square method to solve the following quadratic equations

$0=x^2-2x-8$ **[6 mks]**

(d) Solve the following systems of equation (You may use any method)

2x -3y=10

3x-4y =8

QUESTION 3 - 08 MARKS

(a) A box of resistors increase in price from $N45 to N 52. Calculate the percentage increase. **[2 mks]**

(b) A wooden pole is 208 m long. If you divide it in the ratio of 7:19, what will be length of each piece. **[3 mks]**

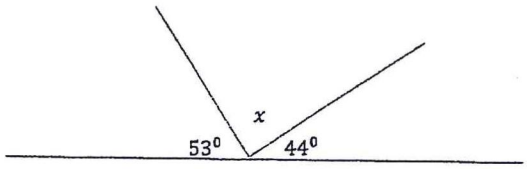
(c) If y is inversely proportional to x and y=15.3 when x=0.6. Determine

(i) Coefficient of proportionality k **[2 mks]**

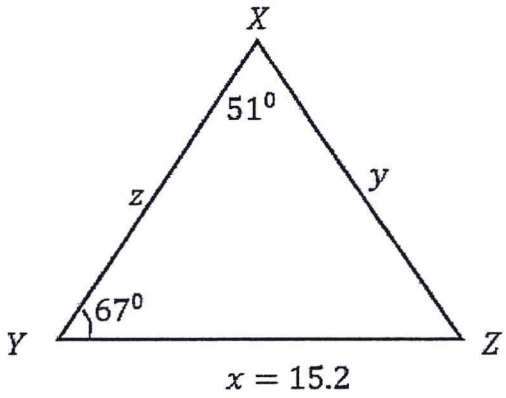
(ii) The value of y when x=1.5 **[1 mks]**

QUESTION 4 - 10 MARKS

(a) Evaluate the angle x in the diagram below. **[2 mks]**



(b) In a triangle below, determine;



$x = 15.2$

(i) angle Z **[1 mks]**

(ii) side XZ **[2 mks]**

(iii) side XY **[2 mks]**

(iv) Area of triangle XYZ **[3 mks]**

SECTION B

QUESTION 5 - 23 MARKS

(a) Indicate whether each of the following variables is quantitative or qualitative. State its measurement scale. (example of data is shown in the bracket) **[5 mks]**

	Variable	Qualitative/Quantitative	Measurement scale
a	Countries (Namibia, S. Africa Zimbabwe)		
b	Rating (Superior, Good, Average)		
c	Temperature ($13^oC, 49^oC, 0.74^oC$)		
d	No. of students per subject (30, 70, 90)		
e	Students ADM No (3749001,22003481)		

(b) Using the data below, 15; 26; 13; 33; 22; 14; 27; 15; 32; 23; 5; 26; 25; 14; 34; 13; 15; 22; 15; 28; 10; 18; 21; 24; 20; 18; 34; 20

(i) Draw a frequency table for the following data **[10 mks]**

(ii) Draw a Histogram for the above data **[8mks]**

QUESTION 6 - 13 MARKS

Use the following set of data to answer the questions that follow;.

13 14 9 17 21 10 15 22 19 13
22 13 19 23 17 21 10 9 20 18

Calculate the following

(a) Range **[1 mks]**

(b) Mode **[1 mks]**

(c) Median **[1 mks]**

(d) Geometric Mean **[2 mks]**

(e) Arithmetic mean **[2 mks]**

(f) Variance **[2 mks]**

(g) Standard Deviation **[2 mks]**

(h) coefficient of variation. **[2 mks]**

QUESTION 7 - 17 MARKS

The Bradford Electric Illuminating Company is studying the relationship between kilowatthours (thousands) used and the number of rooms in a private single-family residence. A random sample of 10 homes yielded the following. Number of Kilowatt-Hours Number of Kilowatt-Hours Rooms (thousands) Rooms (thousands).

(a) Find the correlation coefficient r **[9mks]**

No. rooms (X)	KWH(000) (Y)
12	9
9	7
14	10
6	5
10	8
8	6
10	8
10	10
5	4
7	7

(b) Fit a regression model for the data **[6mks]**

(c) Use the regression model above to find Y when X=30. **[2mks]**

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