NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: NATIONAL DIPLOMA IN PROPERTY STUDIES	
QUALIFICATION CODE:27DPRS, 27DLMR, 27DLAD, 27BPRS	**LEVEL: 4**
COURSE CODE: MSS511S	**COURSE NAME**: MATHEMATICS AND STATISTICS FOR SPATIAL SCIENCES
SESSION: JUNE 2019	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER	Dr CR. KIKAWA
MODERATOR:	Mr ANDREW ROUX

INSTRUCTIONS
1. Answer ALL the questions in the booklet provided. 2. Show clearly all the steps used in the calculations. 3. All written work must be done in blue or black ink and sketches must be done in pencil.

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

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

Section A: Algebra (50 Marks)

1. Attempt the following questions

   1.1. List the first five natural numbers.

   (2 marks)

   1.2. What is the lowest common multiple of 8 and 12?

   (3 marks)

2. Write $2.1\overline{6}$ as a fraction.

   (5 marks)

3. Workout the following fractions giving your answer in its simplest form, no use of a calculator is permitted

   3.1. $\frac{4}{7} \times \frac{2}{3}$

   (2 marks)

   3.2. $\frac{4}{7} \div \frac{3}{5}$

   (2 marks)

4. Expand the following the expressions

   4.1. $(4x^3 + 6x^2 + x) - (x^3 - 7x^2 + 2)$.

   (3 marks)

   4.2. $-3a^3(-2ab^3)(3a^2c^2)$.

   (3 marks)

5. Work out the following questions

5.1. Bukara and Karara are painting the four walls of their bedroom. Each wall has an erea of $x^2 + 3x + 2$ square meters. Included in the total area of the walls is one window with an area of x^2 square meters and a door with an area of $x^2 + x$ square meters, neither of which will be painted. How much area will these brothers be painting?

(8 marks)

5.2. An electric pole, 14 meters high casts a shadow of 10 meters. Find the height of a tree that casts a shadow of 15 meters under similar conditions.

(4 marks)

6. Solve the following simultaneous equations

(6 marks)

$$3x + 7y = 27$$
$$5x + 2y = 16$$

7. Solve the equation below using the method of factorization

(6 marks)

$$2x^2 + 3x - 2 = 0$$

8. Simplify the following ratios

8.1. 1 to 1.5

(3 marks)

8.2. $\frac{1}{4} : \frac{5}{8}$

(3 marks)

Section B: Statistics (50 Marks)

9. A sports director timed 21 people in the sprint race, to the nearest second and the following times were recorded for each of the participants.
59, 65, 61, 62, 53, 55, 60, 70, 64, 56, 58, 58, 62, 62, 68, 65, 56, 59, 68, 61, 67.
You are required to compute and interpret,

   9.1. mean

   (3 marks)

   9.2. median

   (3 marks)

   9.3. mode

   (2 marks)

   9.4. range

   (2 marks)

   9.5. variance

   (3 marks)

   9.6. coefficient of variation

   (2 marks)

10. Using the data provided in question 9, you are required to;

   10.1. construct a frequency distribution table starting with the class interval (51-55), with all entries as discussed in class

   (10 marks)

   10.2. use the information from the frequency distribution table in 9.1, to compute the mode.

   (5 marks)

11. Complete the table and construct a pie chart showing the blood types of the army inductees described in it.

(20 marks)

Table 1: Table showing army inductee blood types

Blood Type	Frequency	Percentage
A	5	-
B	7	-
O	9	-
AB	4	-

END