



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: Bachelor of Regional and Rural Development, Bachelor of Communication, Bachelor of Technology Public Management, Bachelor of Supply Chain Management, Bachelor of Office Management and Technology, Bachelor of Natural Resources Management, Bachelor of Emergency Medical Care, Diploma In Vocational and Training, Bachelor of Hospitality Management	
QUALIFICATION CODE: 07BRRD,07BACO,07BPMN, 07BLSM,07BOMT,07BNTC,07BEMC,06DVET,07HMN	LEVEL: 4
COURSE CODE: BMS411S	COURSE NAME: BASIC MATHEMATICS
SESSION: JULY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100
SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr R Mumbuu, Mrs A Sakaria, Ms Y Shaanika, Mr F Ndinodiva, Mr G Mbokoma, Mr J Amunyela, Mr G Tapedzesa
MODERATOR:	Mrs S Mwewa
INSTRUCTIONS	
1. Answer ALL the questions in answer booklet provided. 2. Write clearly and neatly in black/blue ink. 3. Number the answers clearly.	

PERMISSIBLE MATERIALS

1. Non-Programmable Calculator without the cover

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

SECTION A

QUESTION 1[24 MARKS]

Write down the letter corresponding your best option for each question in the answer booklet provided.

- 1.1 How many numbers from 1-100 inclusive are equal to the square of an integer? [2]
A. 1 B. 100 C. 5 D. 10
- 1.2 Decompose 1200 into a product of its prime factors [2]
A. $2^4 \times 3 \times 5^2$ B. $16 \times 9 \times 5$ C. $2^4 \times 3^2 \times 5$ D. 4×77
- 1.3 The Highest Common Factor for 15, 60 and 90 is: [2]
A. 5 B. 15 C. 60 D. 90
- 1.4 The expression $(9.52 \times 10^{-2}) - (5.58 \times 10^{-2})$ simplifies to (3 s.f) [2]
A. 15.1×10^{-1} B. 1.51×10^{-1} C. 3.94×10^{-2} D. 1.87×10^{-9}
- 1.5 The expression $4m(m - n) + 4m(-m + n)$ simplifies to: [2]
A. $4m^2 - 4mn$ B. 1 C. $4m$ D. 0
- 1.6 Factorize $ax^2 + ab^2$ [2]
A. $a(x^2 + b^2)$ B. $(x - b)(x + b)$ C. $a(x^2 - b^2)$ D. $b(a - b)(a + b)$
- 1.7 If a, b, m and n are real numbers with a and b positive, which one of the following is true ? [2]
A. $a^0 = 0$ B. $\frac{b}{b} = 0$ C. $\sqrt[m]{a^n} = a^{\frac{n}{m}}$ D. $\sqrt[m]{a^n} = a^{\frac{m}{n}}$
- 1.8 Given $B = 2, A = 5, S = 3, I = -1$ and $C = 4$, the expression $BASI^2C$ simplifies to: [2]
A. -120 B. 160 C. 30 D. 120
- 1.9 The value of y in the equation $2 = \frac{4}{y+1}$ is? [2]
A. -3 B. 4 C. 1 D. 7
- 1.10 The original price of a bag is N\$2500. The manager has agreed to give you a discount of 10% for paying cash. After the discount, you are expected to pay 10% VAT for the bag. How much will you pay altogether for the bag? [2]
A. N\$1485. B. N\$2475. C. N\$2574. D. N\$1350

- 1.11 If $A = \{x: x \text{ is an integer, } -3 \leq x \leq 3\}$ and $B = \{x: x \in N, x \leq 3\}$.
The set $A \cap B = ?$ [2]
- A. $\{0\}$ B. \emptyset C. $\{1,2,3\}$ D. $\{9\}$
- 1.12 Ten men can dig a 50 m long trench in 8 hours. Assume that all men work at the same pace. How many men can dig the same trench in 20 hours? [2]
- A. 16 men B. 15 men C. 20 men D. 4 men

SECTION B (show all your calculations)

QUESTION 2 [34 MARKS]

- 2.1 Simplify each of the following expressions without using a calculator.
- 2.1.1 $\frac{1}{4}[(2 \times 3 + 5 \times 4) - (3 \times 2 - 2 \times 4)]$ [4]
- 2.1.2 $2a^2b - ba^2 + 5b^2 + 3a - 10 + 4ab^2 - 3b^2 + 16$ [5]
- 2.1.3 $\frac{60x^4y^3 - 90x^3y^4 + 120x^2y^5}{30x^2y^3}$ [3]
- 2.1.4 $x^2 - (x + y)^2 + 2xy + y^2$ [3]
- 2.2 Perez is 10 years younger than John, who is twice the age of Peter.
If their combine age is 60 years, write an equation in terms of x , hence find the present age of each boy. [6]
- 2.3 Solve the following equations
- 2.3.1 $2(a + 3) = -12$ [3]
- 2.3.2 $\frac{1}{3}x + \frac{1}{4}x + 6 = 8$ [3]
- 2.3.3 The sum of three consecutive numbers is 72. Express each of these numbers in terms of x and find the numbers.
- 2.4 Factorize the following expressions completely
- 2.4.1 $4xy^2 + 16x^2y$ [3]
- 2.4.2 $as - ay - xs + xy$ [4]

QUESTION 3 [42 MARKS]

3.1 Among 110 first year students at NUST in the Department of Mathematics and Statistics, 40 take ANOVA(A), 30 take Linear Algebra(L), 10 both take both subjects.

3.1.1 Represent this information on Venn a diagram. [4]

3.1.2 Find the number of students who:

a) do not take ANOVA [3]

b) take ANOVA or Linear Algebra [3]

c) take ANOVA but not Linear Algebra [3]

d) take exactly one of the two subjects [3]

3.2 Given $\Omega = \{x: x \in N, x < 20\}$

$$A = \{x | x \in N, x < 10, x \text{ is prime}\}$$

$$B = \{3, 5, 7, 9, 11, 13, 15\}$$

$$C = \{x | x \in N, 15 < x \leq 17\}$$

Find

3.2.1 $A \cup B$ [4]

3.2.2 $\overline{A \cap B}$ [4]

3.3 Given that matrix $A = \begin{pmatrix} 4 & 6 \\ 3 & -6 \end{pmatrix}, B = \begin{pmatrix} 4 & 7 \\ -1 & 3 \end{pmatrix}, C = \begin{pmatrix} 2 \\ 3 \end{pmatrix}, D = (2 \ 3)$

Find

3.3.1 AB [4]

3.3.2 $\det(A)$ [2]

3.3.3 $2A + 3B$ [4]

3.4 Find the simple interest payable on a loan of N\$2500 at 25% p.a at the end of 3 years. [4]

3.5 Calculate the amount payable on a loan of N\$5000 for 3 years at the rate of 12.5 % p.a compounded quarterly. [4]

END OF EXAMINATION QUESTION PAPER