NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

**Faculty of Health, Natural Resources and Applied Sciences**

School of Natural and Applied Sciences

Department of Mathematics, Statistics and Actuarial Science

13 Jackson Kaujeua Street
Private Bag 13388
Windhoek
NAMIBIA

T: +264 61 207 2913
E: msas@nust.na
W: www.nust.na

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| QUALIFICATION : Bachelor of Regional and Rural Development, Bachelor of Communication, Bachelor of Technology Public Management, Bachelor of Supply Chain Management, Bachelor of Public Management, Bachelor of Office Management and Technology, Bachelor of Natural Resources Management, Bachelor of Emergency Medical Care, Bachelor of Vocational Instructor, Bachelor of Hospitality Management, Nust Bridging Programme, Bachelor of Culinary Arts. | |
| QUALIFICATION CODE: 07BHOM, 04NBPR, 07BOMC, 07BCNA, 07BRRD, 25BACO, 24BPMA, 07BLSM, 07BOMT, 07BNTC, 24BPMN, 07BRMC | LEVEL: **5** |
| COURSE: **BASIC MATHEMATICS** | COURSE CODE: **BMS411S** |
| DATE: **JANUARY 2025** | SESSION: **1** |
| DURATION: **3 HOURS** | MARKS: **100** |

**SECOND OPPORTUNITY / SUPPLEMENTARY: EXAMINATION QUESTION PAPER**

**EXAMINER:** *Mr Jonas Amunyela, Ms Ponhoyomwene Nghishidivali*

**MODERATOR:** *Mr. Simon Kashihalwa*

**INSTRUCTIONS:**

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

**PERMISSIBLE MATERIALS:**

1. Non-Programmable Calculator

**ATTACHEMENTS:** None

**This paper consists of 6 pages including this front page**

## SECTION A

**(Write down the letter corresponding to the best option for each question)**

## QUESTION 1 [26 Marks]

1.1 45 is a Multiple of? [2]

A. 9 & 3 B. 4 & 9 C. 18 & 4 D. 5 & 9

1.2 Decompose 2024 into products of its prime factors [2]

A. $2^4 \times 3^2 \times 5$ B. $2^5 \times 3^2 \times 7$ C. $2^4 \times 65$ D. $2^3 \times 11 \times 23$

1.3 The Lowest Common Multiple (LCM) of 25 ,120 and 45 is [2]

A. 900 B.120 C. 135000 D. 5 .

1.4 The expression $(9.52 \times 10^{-2}) \times (3.85 \times 10^{7})$ simplifies to (3 s.f) [2]

A. $3.67 \times 10^4$ B. $36.652 \times 10^5$ C. $3.67 \times 10^{-7}$ D. $3.67 \times 10^6$

1.5 The expression $4t - 5x - 2t + 8x - 2t + 1$ simplifies to: [2]

A. $3x + 1$ B. $13x + 1$ C. $-4x - 1$ D. 1

1.6 Factorize $a^2b - b^3$ [2]

A. $a(a^2 - b^2)$ B. $b(a - b)(a + b)$

C. $b(a - b)(a - b)$ D. $a(a - b)(a + b)$

1.7 At present, a man is 41 years old, and his son is 5 years old. After $x$ years, his son's age will be half his age.

What is the son's age after $x$ years? [2]

A. 31 B. 46 C. 36 D. 10

1.8 Given $a = -2\,; b = {}^{1}/_{2}$ , the expression $2ab^2$ simplifies to [2]

A. -1 B. 16 C. 4 D. -8

1.9 The value of $x$ in the equation $\frac{x-2}{2} = \frac{x+2}{4}$ is? [2]

A. 1 B. -7 C. 6 D. 7

1.10 The original price of a bag is N$1750.The manager has agreed to give you a discount of 10% for paying cash. After the discount, you are expected to pay 3.5% VAT for the bag. How much will you pay altogether for the bag? [2]

A. N$1575. B. N$175. C. N$1630.13 D. N$1350.12.

1.11 If $A = \{a, b, c, d, e, f\}$ and $B = \{1,2,3,4\}$.The set $A \cup B$ =? [2]

A. $\{0\}$ B. $\emptyset$ C. $\{1,2,3,4, a, b, c, d, e, f\}$ D. $\{1,2\}$

1.12 Rewrite the fraction $2\frac{5}{7}$ in decimal form correct to 4 decimal places. [2]

A. 2.7142857 B. 2.7142 C. 2.7143 D. 2.714

1.13 Given $A = \begin{pmatrix} 2x & 5 \\ 2 & 1 \end{pmatrix}$ ,the determinant of A is [2]

A. -3 B. $2x - 10$ C. 0 D. $2x$

**SECTION B (show all your calculations)**

**QUESTION 2** **[26 Marks]**

2.1 180 blue balls, 225 pink balls and 270 yellow balls are distributed equally among some students with none left over.

What is the biggest possible number of students? [4]

2.2 Simplify each of the following expressions without using a calculator

2.2.1 $\frac{350}{100-50} + 6 - 4(3 \times 1)$ [4]

2.2.2 $\left(\frac{x^2y^7}{xy}\right)^2$ [4]

2.2.3 $7x^2y + 2xy^3 - 3y^4 + 2xy^3 - 4x^2y$ [3]

2.3 A farmer cuts a 300-foot fence into two pieces of different sizes. The longer piece should be four times as long as the shorter piece.

2.3.1 Write an equation in terms of $x$, representing the total length of the two pieces [2]

2.3.2 How long are the two pieces? [3]

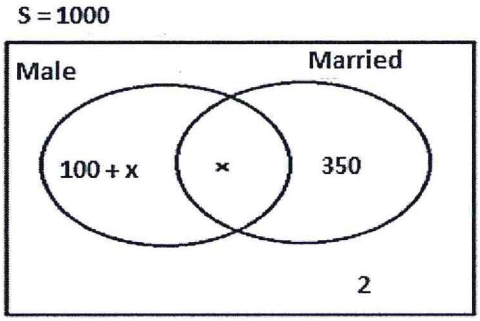
2.4 Solve for $x$ in the following equations

2.4.1 $3^{2x+1} = 9$ [3]

2.4.2 $4x - 3 = 2 + \frac{5}{2}x$ [3]

**QUESTION 3** **[43 Marks]**

3.1 Consider the Venn diagram below illustrating the marital status of staff members in an organization




3.1.1 What is the value of x? [4]

3.1.2 How many female staff members are there in this organization? [2]

3.1.3 How many of the female staff members are married? [2]

3.1.4 How many male staff members were single? [2]

3.1.5 Find the number of staff members who are male or Married [2]

3.1.6 What is the percentage of single female are there in this organisation [2]

3.2 $Let: \Omega = \{1,2,3,4,5,6,7,8,9,10\}$ , $A = \{x: x\ is\ an\ integer\ and\ 1 \leq x \leq 6\}$ ,

$B = \{5,6,7,8,9\}$

Find

3.2.1 $A \cup B$ [3]

3.2.2 $A \cap \bar{B}$ [3]

3.2.3 $(A \cup B)^c$ [2]

3.2.4 $\bar{A} \cap \bar{B}$ [3]

3.2.5 $A - B = \{1, 2, 3, 4\}$ [2]

3.4 Given that matrix $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 0 & 2 \\ 6 & 3 \end{pmatrix}$

3.4.1 Obtain the matrix $A^2$. [5]

3.4.2 Find the determinant of the matrix $A$. [2]

3.4.3 Obtain the matrix $A - 2B$. [4]

3.5 Find the value of $x, y \; and \; z$ in the matrix equation below:

$$\begin{pmatrix} 2 & x \\ y & 7 \end{pmatrix} + \begin{pmatrix} 6 & y \\ 3 & -1 \end{pmatrix} = \begin{pmatrix} x & 6 \\ z & 6 \end{pmatrix}$$ [5]

**Question 4** **[5 Marks]**

4.1 Congratulation!! You just won N$50 000! You decide to invest your money, and the bank presents you with this investment plan. You may invest your N$50 000 at 5% interest, compounded quarterly, for a period of ten years.

How much interest are you going to earn after 10 years? [5]

**END OF EXAMINATION PAPER**