NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL 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 Tourism management, and Bachelor of Hospitality Management	
QUALIFICATION CODE: 07BRRD, 25BACO,07BLSM,07BOMT, 07BNTC,24BPMN, 07BRCMC	**NQF LEVEL:** 4
COURSE NAME: BASIC MATHEMATICS	**COURSE CODE**: BMS411S
DATE: JUNE 2022	**PAPER :** THEORY
DURATION: 3 HOURS	**MARKS: 100**

FIRST OPPORTUNITY EXAMINATION	
EXAMINER (S)	Mr. SP KASHIHALWA , Mr J AMUNYELA, Dr J Mwanyekange, Mrs. P Nghishidivali
MODERATOR:	Dr J Ongala

INSTRUCTIONS

1. Answer ALL the questions in the answer sheet.
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

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

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

QUESTION 1 [16 MARKS]

Write down the letter corresponding to the best option for each question in the answer booklet/sheet provided.

1.1 What is the solution of this linear equation $bx + c = 0$

A. $x = \frac{-c}{b}$ B. $x = \frac{b}{c}$ C. $x = \frac{c}{b}$ D. $x = \frac{-c^2}{b}$ [2]

1.2 Which of the following is a rational number

A. $\sqrt{2}$ B. $\sqrt{2^6}$ C. π D. $\sqrt{17}$ [2]

1.3 S= $\{1,2,3 \ldots 10\}, A = \{2,4,6,8,10\}, B = \{1,3,5,7,9\}, C = \{2,5,7,\}, D = \{1\}$.
Find $n(B \cup C)$

A. $\{1, 2,5,7\}$ B. $\{0\}$ C. $\emptyset$ D. 5 [2]

1.4 If vector $\begin{pmatrix} 2 \\ 2^{-4} \end{pmatrix} = \begin{pmatrix} 2 \\ 2x - 3 \end{pmatrix}$ determine the value of x

A. 5.1 B. impossible C. $\frac{49}{32}$ D. 4 [2]

1.5 If matrix $A = \begin{bmatrix} 4 & 6 \\ 2 & 8 \end{bmatrix}, I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, Find $\det(AI)$

A. 20 B. 9 C. Matrix A D. $\begin{bmatrix} 4 & 6 \\ 1 & 8 \end{bmatrix}$ [2]

1.6 Find the HCF of 9, 11 and 10

A. None B. 1 C. 9 D. 9 and 10

1.7 Find the LCM of 9, 11 and 10

A. 99 B. 909 C. 990. D. 90 [2]

1.8 If VAT is 15%, a bag of cement cost N$ 75.00 excluding VAT, How much will a bag cost if you add VAT [2]

A. 86.25 B. 86.52 C. 25.86 D. 11.25

QUESTION 2 [31] MARKS] (Clearly show all your work)

2.1 Solve the following linear equations

2.1.1. $2x - \frac{3}{7} = \frac{x}{5} + 1$ [4]

2.1.2 $3(2x - 5) = 7$ [4]

2.1.2. $\frac{2x-1}{3} = \frac{7}{8}x$ [4]

2.2 The national debt of Namibia is 70% of GDP. If GDP is $ 250 million. Find the national debt and write your answer in floating decimal. [4]

2.3 A choir coordinator wants to divide the choir into smaller groups. There are 24 sopranos, 60 altos and 36 tenors. Each group will have the same number of each type of voice. What is the greatest number of groups that can be formed and how many sopranos, altos and tenors will be in each group? [9]

2.4 Evaluate the following,

2.4.1 $\frac{(240\div 4)}{(28-16)} + 17 - 3(2 \times 2)$ [6]

QUESTION 3 [26 MARKS] (Clearly show all your work)

3.1 If $S = \{1,2,3,4,5,6,7,8,9,10\}, B = \{x^2 : x \in N, x < 4\}, C = \{3x : x \in N, x < 4\}$

$$D = \{Odd\ numbers\ less\ than\ 10\}$$

Find

3.2.1 $n(B \cap D)$ [3]

3.2.2 D^c [4]

3.2.3 $B \oplus C$ [4]

3.2.4 $(B \cup C)^c$ [4]

3.2 Out of 360 students interviewed, it was found that 185 students speak Spanish (S), 55 students speak neither Spanish nor Portuguese. Furthermore, $(x + 7)$ students speak Portuguese (P) only and x speak both language

3.2.1 Draw a Venn diagram and show the information as given above on the Venn diagram [5]

3.2.2 Solve for x [3]

3.2.3 Find the number of students who speak Spanish only. [3]

QUESTION 4[13 MARKS] (Clearly show all your work)

If $A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}, B = 2A, \quad C = A + B$, Find

4.1 ΔB [4]

4.2 $B + C$ [4]

4.3 BA [8]

Question 5[11 MARKS] (Clearly show all your work)

5.1 Hage borrow N$ 500 000 to purchase furniture from a commercial bank, which offer him 20% via simple interest, how much will he pays back if he is required to pay the loan back after 5 years [5]

5.2 Hage borrow N$ 500 000 for debt consolidation from a commercial bank, which offer him 20% compounded semi-annually, how much will he pays back if he is required to pay the loan back after 5 years. [6]

END