NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: Bachelor of Technology: Geo-Information Technology, Bachelor of Human Resources Management, Bachelor of Marketing, Bachelor of Transport Management, Bachelor of Business Administration, Bachelor of Agricultural Management, Bachelor of Horticulture	
QUALIFICATION CODE: 07BGIT,07BHRM,07BMAR,07BBAD,27BAGR,07BTRM,07BHOR	**NQF LEVEL:** 5
COURSE NAME: INTRODUCTION TO MATHEMATICS (BUSINESS AND MANAGEMENT)	**COURSE CODE:** ITM111S
DATE: JULY 2022	**PAPER :**THEORY
DURATION: 3HOURS	**MARKS:** 100

SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER	**Ms A. SAKARIA,** Ms K. DAVID, Ms P. NGHISHIDIVALI, Mr N. MAFALE, Mr I. NDADI, Dr J. MWANYEKANGE
MODERATOR:	Mr G. TAPEDZESA

INSTRUCTIONS
1. Answer ALL the questions in the answer sheet. 2. **QUESTION 1** of this question paper entail multiple choice questions with options A to D. Write down the letter corresponding to the best option for each question. 3. For **QUESTION 2** indicate whether the given mathematical statements are true (**T**) or false (**F**). 4. **QUESTION 3** show clearly all the steps used in the calculations.

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

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

QUESTION 1 [30 MARKS]

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

1.1 Evaluate: $63-(-3)(-2-8-4)\div\left[3\left(5+(-2)(-1)\right)\right]$. [3]

A. 65 B. 60 C. -60 D. 61

1.2 Express $8\frac{2}{7}\%$ as a fraction. [3]

A. $\frac{58}{7}$ B. $\frac{29}{50}$ C. $\frac{29}{350}$ D. $\frac{7}{58}$

1.3 Find the Lowest Common Multiple (LCM) of the numbers $15, 25, 40$ and 75. [3]

A. 900 B. 400 C. 600 D. 9800

1.4 Simplify $\left(\frac{1}{4}\right)^{-\frac{1}{2}}$. [3]

A. $\frac{1}{2}$ B. 2 C. $\sqrt{2}$ D. $\frac{1}{16}$

1.5 Given vector $A=\begin{pmatrix}-2 & 9\end{pmatrix}$, find $2A$. [3]

A. $\begin{pmatrix}-4 & -9\end{pmatrix}$ B. $\begin{pmatrix}4 & 18\end{pmatrix}$ C. $\begin{pmatrix}-4 & 18\end{pmatrix}$ D. $\begin{pmatrix}-18 & -4\end{pmatrix}$

1.6 The roots of the quadratic equation $x^2-3x+2=0$ are: [3]

A. $1,-2$ B. $-1,-2$ C. $-1,2$ D. $1,2$

1.7 Express the statement "5 more than the product of 3 and a number" in terms if x. [3]

A. $5x-3$ B. $3x+5$ C. $3-5x$ D. $3x(5)$

1.8 Factorize the expression $2ab^2-abd-2bc+cd$ [3]

A. $(2b-d)(ab-c)$ B. $(ab-c)(ab-c)$ C. $(2b-d)(ab+c)$ D. $(2b+d)(ab-c)$

1.9 If $P=\{0,1,2.3,4\}$, $Q=\{4,6,8\}$ and $R=\{6,12,18\}$, find $(P\cap Q)\cup(Q\cap R)$. [3]

A. $\{1,2,3,4,6,8\}$ B. $\{4,6,8\}$ C. $\{4,6\}$ D. $\{4\}$

1.10 Determine the sum of the series $\sum_{n=1}^{5}(1+n)$. [3]

A. 6 B. 17 C. 20 D. 25

QUESTION 2 [10 MARKS]

Indicate whether the given mathematical statements are true (T) or false (F)

2.1 The number 0.51×10^{-3} is in standard form. [2]

2.2 The expression $(x+2)^3$ simplifies to x^3+2^3. [2]

2.3 $\log_5 4=\dfrac{\log_{10}4}{\log_{10}5}$ [2]

2.4 The discriminant of the equation $2x^2-4x+9=0$ is negative. [2]

2.5 If A and B are both 2×3 matrices then, we can calculate AB. [2]

QUESTION 3 [60 MARKS] (Clearly show all your work)

3.1 Let $S=\{1,2,3,4,5,6,7,8,9,10,11,12\}$, $A=\{1,3,5,6,7\}$, $B=\{1,5,8,9\}$, $C=\{2,4,5,6,9\}$
Find:

3.1.1 $A^c\cup B$ [4]

3.1.2 $(B^c\cup C)\cap A$ [6]

3.2 Let $A=\begin{pmatrix}-2 & 3\\ 4 & 5\end{pmatrix}$ and $B=\begin{pmatrix}-3 & -1\\ 1 & 0\end{pmatrix}$ be two matrices.

3.2.1 Determine the matrix A^2. [4]

3.2.2 Find $A-\dfrac{1}{3}B$ [6]

3.2.3 Find $(AB)^{-1}$ [6]

3.3 Find the values of the letters, x, y, r *and* t if:

$$\begin{pmatrix} -2x & y \\ 2r & 3t \end{pmatrix} - 3\begin{pmatrix} y & 2 \\ x & 6 \end{pmatrix} = \begin{pmatrix} 12 & 24 \\ -9 & 12 \end{pmatrix}$$ [8]

3.4 If $x+2; 3x-1;$ and $4x-3$ are the first three terms of an arithmetic progression(AP):

3.4.1 Determine the value of x. [4]

3.4.2 Write numerical values of the first three terms. [3]

3.4.3 If the nth term is -41 , calculate the value of n. [4]

3.5 Of the students in class, 15 can spell the word 'Parallel' (Pa), 14 can spell 'Pythagoras' (Py), 5 can spell both words and 4 can spell neither.

3.5.1 Draw a Venn diagram to show the information above. [5]

3.5.2 How many students are there in the class? [2]

3.5.3 How many students can spell Parallel or Pythagoras? [2]

3.5.4 How many students can spell exactly one of the two words? [2]

3.6 Calculate the maturity value of an investment of $N\$680000$ due in 7 years when the annual simple interest rate is 9.5%. [4]

END OF EXAMINATION QUESTION PAPER