



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY
FACULTY OF HEALTH AND APPLIED SCIENCES**

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	NQF LEVEL: 5
COURSE NAME: INTRODUCTION TO MATHEMATICS (BUSINESS AND MANAGEMENT)	COURSE CODE: ITM111S
SESSION: JULY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER	Ms A. SAKARIA, Ms Y. SHAANIKA, Mr I. NDADI, Mr SP. KASHIHALWA, Mr R. MUMBUU, Dr N. CHERE, Mr T. KAENANDUNGE, Mr E. MWAHI
MODERATOR:	Mr G. TAPEDZESA
INSTRUCTIONS	
<ol style="list-style-type: none">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.4. You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the invigilator	

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

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

SECTION A [36 Marks]

QUESTION 1

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

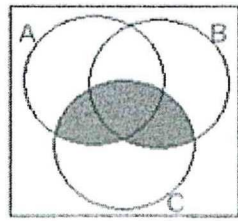
1.1 The factors for the expression $-xyz + xpy - zp + z^2$ are? [3]

- A. $(xy + z)(p - z)$ B. $(xy - z)(p + z)$ C. $(z - xy)(p + z)$ D. $(xy - z)(p - z)$

1.2 The lowest common multiple (LCM) for 20, 280 and 220 is? [3]

- A. 1540 B. 6160 C. 770 D. 3080

1.3 From the Venn diagram below, describe the shaded area? [3]



- A. $A \cup B \cup C$ B. $A \cap B \cap C$ C. $(A \cap B) - C$ D. $(A \cup B) \cap C$

1.4 The solution to the equation $5x - 7 + x = 4x + 25$ is? [3]

- A. $x = 5$ B. $x = 3$ C. $x = 15$ D. $x = 16$

1.5 Expand and simplify the expression $4ab^2 + (2ab - b)^2$? [3]

- A. $4a^2b^2 + 8ab^2 + b^2$ B. $4a^2b^2 + b^2$ C. $4ab^2 + 4a^2b^2 + b^2$ D. $4ab + b^2$

1.6 Find the value of x in the following ratio $x : 15$ if the ratio simplify to $4 : 3$? [3]

- A. -1 B. 1 C. 30 D. 20

1.7 By solving the inequality $3(a - 6) < 4 + a$ the answer will be? [3]

- A. $a < 9$ B. $a < 12$ C. $a < 13$ D. $a < 11$

1.8 A jean costs N\$175.00 before VAT is added on it. A customer pays N\$ 194.25, VAT inclusive for the jean, what percentage of VAT has been added to the jean's price? [3]

- A. 6% B. 11% C. 90% D. 4%

1.9 Simplify $x^2\sqrt{y} \times \sqrt{x^4 \times y^{\frac{1}{2}}}$ [3]

- A. $y\sqrt{x}$ B. $xy^{\frac{1}{2}}$ C. $xy^{\frac{1}{4}}$ D. $x^4y^{\frac{3}{4}}$

1.10 Evaluate $\log_2 16 + \log_3 27 + \log 1$ [3]

- A. 4 B. 3 C. 7 D. 8

1.11 The simultaneous solution to the equations $2x - y = 5$ and $x + y = 4$ is? [3]

- A. $x = 2$ and $y = 3$ B. $x = 3$ and $y = 0$ C. $x = 0$ and $y = 1$ D. $x = 3$ and $y = 1$

1.12 If A is an $n \times n$ matrix and the determinant of A is non zero, then AA^{-1} , is? [3]

- A. I B. A^2 C. A D. A^{-1}

SECTION B [66 Marks]

QUESTION 2 (Clearly show all your work)

2.1 Find the values of the letters in the given matrix equation: [5]

$$\begin{pmatrix} x & y \\ p & q \end{pmatrix} \begin{pmatrix} 2 & -1 \\ -3 & 0 \end{pmatrix} = \begin{pmatrix} 2 & 2 \\ -1 & -1 \end{pmatrix}$$

2.2 Find the sum of the series $3 + 5 + 7 + \dots + 119$ [6]

2.3 In the progression 2; 6; 18; 54 ... find the 12th term? [4]

2.4 Find the summation of $\sum_{a=3}^5 (a^2 - a)$ [4]

2.5 Calculate the maturity of an investment of N\$ 680 000 due in 7 years when the annual simple interest rate is 9.5% [3]

2.6 Determine the compound amount if N\$50 000 is invested for 15 years at 4.5% per annum compounded quarterly? [5]

2.7 Use Cramer's rule to solve the following equation? [4]

$$3x + 4y = 7$$

$$x - 5y = -4$$

QUESTION 3(33 MARKS)

3.1 In a group of students, 65 play football, 45 play hockey, 42 play cricket, 20 play football and hockey, 25 play football and cricket, 15 play hockey and cricket, 8 play all the three games. Let F, H and C represent the set of students who play football, hockey and cricket respectively.

i) Draw a Venn diagram to represent the above information? [4]

ii) Find the number of students who play both football only [2]

iii) Find the number of students who play both hockey and cricket only [2]

iv) Find the number of students who play hockey only [2]

v) Find the number of students who play both football and hockey only [2]

3.2 Solve the following equation and inequality?

3.2.1 $\frac{2}{x} + \frac{x}{x-1} = 5$ (Use quadratic formula) [8]

3.2.2 $x + 11 \geq 3x + 1$ [4]

3.3 Evaluate the following

$$3.3.1 \quad \frac{1}{3} \div \frac{2}{5} \left(\frac{1}{4} - \frac{2}{3} \right) + 4 \frac{3}{4} \times \frac{1}{2} \quad [4]$$

$$3.3.2 \quad \frac{\frac{3}{8} - \frac{1}{5}}{\frac{7}{10} - \frac{2}{3}} \quad [4]$$

$$3.3.3 \quad \frac{7}{8} \div \frac{3}{4} \quad [1]$$

END