



PAMIBIA 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: NOVEMBER 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100
FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINERS	Ms A. SAKARIA, Ms S.Mwewa, Mr B. Obabueki
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. Marks will not be awarded for answers obtained without showing the necessary steps leading to them (the answers).4. All written work must be done in blue or black ink and sketches must be done in pencil.5. 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 cover page)

1.6 Simplify the expression $\frac{1}{xy} + xy - \sqrt[3]{8}$, if $x = 8$ and $y = 5$. [3]

- A. -1 B. 1 C. $38\frac{1}{40}$ D. 78

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

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

1.8 The simultaneous equations $x - y = 13$ and $x + y = -3$ have the solution: [3]

- A. $x = -5$ and $y = -8$ B. $x = 14$ and $y = 1$
C. $x = 8$ and $y = -5$ D. $x = 5$ and $y = -8$

1.9 Mr. Jonas invested \$8200 at the rate of 4.5 % p.a. It earned \$738 simple interest. The period of Investment was: [3]

- A. 6 months B. 1 year C. 2 years D. 3 years

1.10 What is the sum of the series $\sum_0^5(n^3 + 3)$? [3]

- A. 128 B. 131 C. 240 D. 243

QUESTION 2 [15 Marks]

2.1 A farmer has enough food to feed 20 cattle in his herd for 6 days. How long will the food last if there were 10 more cattle in his herd? [3]

- A. 9 days B. 3 days C. 4 days D. 12 days

2.2 Simplify the expression $\frac{7^{x+1} \times 7^{x+2}}{7^{x-1} \times 7^{x-2}}$. [3]

- A. 7^6 B. 7^0 C. 7^{-2} D. 7^{4x+6}

2.3 A bottle of lemonade contains $1\frac{1}{2}$ littles. A glass holds $\frac{1}{8}$ littles. How many glasses can be filled from one bottle of lemonade? [3]

- A. $1\frac{5}{8}$ B. $\frac{3}{16}$ C. 12 D. 24

2.4 An integer x is such that $60 \leq x \leq 70$. Write down a value of x which is

2.4.1 A prime number. [2]

- A. 61 B. 63 C. 7 D. 70

2.4.2 A multiple of 9. [2]

- A. 72 B. 81 C. 9 D. 63

2.4.3 A square number.

- A. 100 B. 64 C. 5^2 D. $\sqrt{16}$ [2]

SECTION B (Clearly show all your work)

QUESTION 3 [55 Marks]

3.1 Given the universal set $S = \{1,2,3,4,5,6,7\}$, set $A = \{1,3,4,5\}$ and set $B = \{1,3,5,6\}$, find:

3.1.1 $A^c \cap B^c$ [3]

3.1.2 $B^c \cup A$ [3]

3.1.3 $n(B^c \cup A)$ [1]

3.1.3 $(A \cap B)^c$ [3]

3.2 Expand and simplify the following expressions:

3.2.1 $-2x^2y^2 + (xy - y)^2$ [2]

3.2.2 $3x(x - 3) + x(x - 2)$ [3]

3.2.3 $(x - 2)^2 - (x + 1)^2$ [4]

3.3 Solve the following inequality: $2x - 4 < \frac{1}{2}(40 - 4x)$. [4]

3.4 Solve the following equation using the quadratic formula: $3x^2 - 4x + 1 = 0$ [5]

3.5 Evaluate the logarithmic expression $\log_2 2 + 2 \log_5 10 - \log_5 4$, without using a calculator. [5]

3.6 Given the formula, $S = \frac{n}{2}[2a_1 + (n - 1)d]$ find the sum of the series $3 + 9 + 15 + \dots$ as far as the 50th term. [4]

3.7 Determine the values of a, b, c, and d in the following: [6]

$$\begin{bmatrix} 2 & 3 \\ -1 & -1 \end{bmatrix} + a \begin{bmatrix} 2 & 1 \\ 0 & 4 \end{bmatrix} = \begin{bmatrix} 8 & b \\ c & d \end{bmatrix}$$

3.8 Given the following Matrix $D = \begin{bmatrix} 3 & 0 \\ 1 & -2 \end{bmatrix}$, find $-\frac{1}{2}D^{-1}$. [7]

3.9 Use Cramer's rule to solve the system of equations $2x + 3y = 5$ and $5x - 2y = -16$. [5]

END OF QUESTION PAPER