TEST 2 MEMORANDUM

EXAMINER(S)  Mr. R. Mumbuu, Mr. J Amunyela, Ms. Y Nkalle, Mr. F. Ndinodiva

MODERATOR:  Ms S. Mwewa

INSTRUCTIONS
1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS
1. Non-Programmable Calculator without the cover

THIS QUESTION PAPER CONSISTS OF _4_ PAGES (Including this front page)
SECTION A

QUESTION 1 (24 marks)

1.1 If 31 is the result of adding 1 to 5 times a number, find the number
A. 5  B. 6√√√  C. 32  D. 30

1.2 At present a mother is 32 years older than her daughter. Six years ago she was three times as old as her daughter was then. What is the present age of the daughter?
A. 22 years√√√  B. 48 years  C. 32 years  D. 20 years

1.3 Of the 20 students in a class, 17 play soccer and 10 play volley ball. How many students play both soccer and volley ball?
A. 27 Students  B. 7 Students  C. 20 Students  D. 3 Students

1.4 If A = \{x^2: x is an integer and 1 ≤ x < 4\} and B = \{2x: x is an integer and 2 ≤ x ≤ 7\} Find A ∩ B:
A. A ∩ B = \{6\}  B. A ∩ B = \{6,8\}  C. A ∩ B = \{4,8\}  D. A ∩ B = \{4\}

1.5 If S = \{1, 2, 3, 4, ..., 10\} and A = \{7,8,9,10\}, Which of the following is true:
A. set A is a subset of S√√√  B. set S is a subset of A  C. \(\bar{A}\) = \(\emptyset\)  D. None of the above

1.6 Given \(\begin{pmatrix} 2 & 0 \\ 0 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 10 \\ 3 \end{pmatrix}\), what is the value of x?
A. 10  B. 5√√√  C. 3  D. 2

1.7 Given \(A = \begin{pmatrix} 2 & 5 \\ 7 & 1 \end{pmatrix}, B = \begin{pmatrix} 1 \\ 0 \end{pmatrix}\), and \(C = \begin{pmatrix} 3 \\ 9 \end{pmatrix}\), which of the following matrix multiplication is possible?
A. BA  B. AC  C. AB √√√  D. C^2

1.8 If the determinant of matrix A = \(\begin{pmatrix} 2 & y \\ 5 & 4 \end{pmatrix}\) is 3, find the value of y?
A. 1  B. -1√√√  C. 3  D. 5
SECTION B

QUESTION 2 (26 marks)

2.1

2.1.1 \(4(5 + 2y) - 3y = 15\) \(\text{[3]}\)

\[20 + 8y - 3y = 15\]
\[5y = -5\]
\[y = -1\]

2.1.2 \(\frac{2x}{3} - \frac{x}{4} = 7\) \(\text{[3]}\)

\[x = 84\]

\[\times 12; \quad 8x - 3x = 84\]

\[\frac{5x}{5} = \frac{84}{5}\]

\[x = \frac{84}{5} \text{ or } 16.8 \text{ or } 16 \frac{4}{5}\]

2.2

2.2.1 Represent this information on a venn diagram.

![Venn diagram with numbers 8, 17, and 9]
2.2.2 Find the value of $y$.

\[
y = \Omega - (A \cup B) = 50 - (9+17+8) = 50 - 34 = 16
\]

The number of students not taking any subject is 16.

2.2.3 Find the number of students taking ANOVA or Basic Mathematics

\[
n(A \cup B) = n(A) \text{ only} + n(B) \text{ only}
\]

\[
n = 9 + 8
\]

\[
n = 17
\]

The number of students taking ANOVA or Basic Mathematics is 17.

3.3 Given that matrix $A = \begin{pmatrix} 4 & 6 \\ 3 & -6 \end{pmatrix}, B = \begin{pmatrix} 4 & 7 \\ -1 & 3 \end{pmatrix}, C = \begin{pmatrix} 2 \\ 3 \end{pmatrix}, D = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Find

3.3.1 $\text{det } A$ \hspace{1cm} [2]

\[
\text{det}(A) = (4 \times -6) - (3 \times 6) = -42
\]

3.3.3 $2A + 3B$ \hspace{1cm} [4]

\[
2A + 3B = 2 \begin{pmatrix} 4 & 6 \\ 3 & -6 \end{pmatrix} + 3 \begin{pmatrix} 4 & 7 \\ -1 & 3 \end{pmatrix} = \begin{pmatrix} 8 & 12 \\ 6 & -18 \end{pmatrix} + \begin{pmatrix} 12 & 21 \\ -3 & 9 \end{pmatrix} = \begin{pmatrix} 20 & 33 \\ 3 & -9 \end{pmatrix}
\]

3.3.4 $DC = \begin{pmatrix} 2 & 3 \end{pmatrix} \begin{pmatrix} 2 \\ 3 \end{pmatrix} = (2 \times 2 + 3 \times 3) = (13)$ \hspace{1cm} [4]
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

QUALIFICATION CODE: 07BRRD, 25BACO, 24BPMA, 07BLSM, 07BOMT, 07BNTC, 24BPMN 07BRMC

LEVEL: 4

COURSE CODE: BMS411S

COURSE NAME: BASIC MATHEMATICS

SESSION: 5 October 2019

PAPER: THEORY

DURATION: 1h30

MARKS: 50

TEST 2 QUESTION PAPER

EXAMINER(S): Mr. R. Mumbuu, Mr. J. Amunyela, Ms. Y. Nkalle, Mr. F. Ndinodiva

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INSTRUCTIONS

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PERMISSIBLE MATERIALS

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THIS QUESTION PAPER CONSISTS OF _3_ PAGES (Including this front page)
SECTION A (Write down the letter corresponding to your best option for each question in the answer booklet/sheet provided.)

QUESTION 1 (24 marks)

1.1 If 31 is the result of adding 1 to 5 times a number, find the number [3]

A. 5  B. 6  C. 32  D. 30

1.2 At present a mother is 32 years older than her daughter. Six years ago she was three times as old as her daughter was then. What is the present age of the daughter? [3]

A. 58 years  B. 22 years  C. 32 years  D. 15 years

1.3 Of the 20 students in a class, 17 play soccer and 10 play volley ball. How many students play both soccer and volley ball? [3]

A. 27 Students  B. 7 Students  C. 20 Students  D. 3 Students

1.4 If \( A = \{ x^2 : x \text{ is an integer and } 1 \leq x < 4 \} \) and \( B = \{ 2x : x \text{ is an integer and } 2 \leq x \leq 7 \} \) find \( A \cap B : \) [3]

A. \( A \cap B = \{ 6 \} \)  B. \( A \cap B = \{ 6, 8 \} \)  C. \( A \cap B = \{ 4, 8 \} \)  D. \( A \cap B = \{ 4 \} \)

1.5 If \( S = \{ 1, 2, 3, 4, \ldots, 10 \} \) and \( A = \{ 7, 8, 9, 10 \} \), which of the following is true: [3]

A. set A is a subset of S  
B. Set S is a subset of A  
C. \( \tilde{A} = \emptyset \)  
D. None of the above

1.6 Given \( \begin{pmatrix} 2 & 0 \\ 0 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 10 \\ 3 \end{pmatrix} \), what is the value of x? [3]

A. 10  B. 5  C. -1  D. 2
1.7 Given \( A = \begin{pmatrix} 2 & 5 \\ 7 & 1 \end{pmatrix}, B = \begin{pmatrix} 1 \\ 3 \end{pmatrix}, \) and \( C = \begin{pmatrix} 3 & 9 \end{pmatrix} \), which of the following matrix multiplication is possible? (3)

A. \( BA \)  
B. \( AB \)  
C. \( AC \)  
D. \( C^2 \)

1.8 If the determinant of matrix \( A = \begin{pmatrix} 2 & y \\ 5 & 4 \end{pmatrix} \) is 3, find the value of \( y \)? \( [3] \)

A. 1  
B. -1  
C. 3  
D. 5

SECTION B (SHOW ALL YOUR WORK)

QUESTION 2 (26 marks)

2.1 Find the value of the variables in the following linear equations

2.1.1 \( 4(5 + 2y) - 3y = 15 \) \( [3] \)

2.1.2 \( \frac{2x}{3} - \frac{x}{4} = 7 \) \( [3] \)

2.2 A group of 50 students at the Namibia University of Science and Technology, take at least one of these subjects: ANOVA(A) and Basic Mathematics(B). 17 take both subjects, 8 take ANOVA only, 9 take Basic Mathematics only and \( y \) take neither subjects.

2.2.1 Represent this information on a venn diagram. \( [4] \)

2.2.2 Find the value of \( y \). \( [3] \)

2.2.3 Find the number of students taking ANOVA or Basic Mathematics \( [3] \)

3.3 Given that matrix \( A = \begin{pmatrix} 4 & 6 \\ 3 & -6 \end{pmatrix}, B = \begin{pmatrix} 4 & 7 \\ -1 & 3 \end{pmatrix}, C = \begin{pmatrix} 2 \\ 3 \end{pmatrix}, D = \begin{pmatrix} 2 & 3 \end{pmatrix} \)

Find

3.3.1 \( \det A \) \( [2] \)

3.3.3 \( 2A + 3B \) \( [4] \)

3.3.4 \( DC \) \( [4] \)