FEEDBACK TUTORIAL LETTER

1st SEMESTER 2019

ASSIGNMENT 2

FOR
BASIC MATHEMATICS
BMS411S
Course Name: BASIC MATHEMATICS
Course Code: BMS411S
Department: MATHEMATICS AND STATISTICS
Course Duration: ONE SEMESTER
NQF Level and Credit: NQF LEVEL 4 AND CREDIT 12

COMMUNICATION WITH YOUR MARKER-TUTOR

Contact with tutors for academic matters
The names and contact details of tutors will be available upon registration, as part of your **DE Pocket Guide**. Tutors should only be contacted in connection with **academic matters** relating to your course.
Please make sure before contacting your tutor, that you know exactly what you are seeking assistance for. Always have your questions and study guide at hand when phoning.

*Please sms your tutor to arrange a telephonic/WebEx tutorial*

Your marker-tutor for BASIC MATHEMATICS
Tel.: 061 207 2938
E-mail: jamunyela@nust.na

Your moderator for **ADD COURSE NAME HERE**
Tel.: **telephone number here**
E-mail: **email address here**

Your content-editor for **ADD COURSE NAME HERE**
Tel.: **telephone number here**
E-mail: **email address here**
COLL HYPERLINKS

COLL ANNOUNCEMENTS: http://www.nust.na/?q=centres/coll/coll-announcement
COLL STUDENT SUPPORT: http://www.nust.na/?q=centres/coll/student-support
E-LEARNING: http://elearning.nust.na/elearn/
ASSIGNMENT SUBMISSION: collassignments@nust.na
ASSIGNMENT DUE DATES: Information Manual for Distance Education Students (DE Manual), Available from http://www.nust.na/?q=centres/coll/about-coll
NUST's Policies and Regulations: http://www.nust.na/?q=download/annual-reports-documents

• Dates for 1st, 2nd Opportunity/ Supplementary Examination: To be announced on the NUST webpage.

Username: nust
Password: 123

WebEx: https://vc.uc.nust.na/orion/login
NUST Writing Unit: Tel: 061 – 2072383
Email: writingunit@nust.na
NUST Mathematics Tutoring Centre: Tel: 061 – 2072523/2072913
Website: http://mathstutoring.nust.na
Turnitin: www.turnitin.com
STATEMENT ABOUT ACADEMIC HONESTY AND INTEGRITY

All staff and students of Namibia University of Science and Technology (NUST), upon signing their employment contracts and registration forms, commit themselves to abide by the policies and rules of the institution. The core activity of NUST is learning and in this respect academic honesty and integrity is very important to ensure that learning is valid, reliable and credible.

NUST therefore does not condone any form of academic dishonesty, including plagiarism and cheating on tests and assessments, amongst other such practices. NUST requires students to always do their own assignments and to produce their own academic work, unless given a group assignment.

Academic Dishonesty includes, but is not limited to:

- Using the ideas, words, works or inventions of someone else as if it is your own work.
- Using the direct words of someone else without quotation marks, even if it is referenced.
- Copying from writings (books, articles, webpages, other students’ assignments, etc.), published or unpublished, without referencing.
- Syndication of a piece of work, all or part of an assignment, by a group of students, unless the assignment was a legitimate group assignment.
- The borrowing and use of another person’s assignment, with or without their knowledge or permission.
- Infringing copyright, including documents copied or cut and pasted from the internet.
- Asking someone else to prepare an assignment for you or to write or sit an assessment for you, whether this is against payment or not.
- Re-submitting work done already for another course or programme as new work, so-called self-plagiarism.
- Bringing notes into an examination or test venue, regardless of whether the notes were used to copy or not.
- Receiving any outside assistance in any form or shape during an examination or test.

All forms of academic dishonesty are viewed as misconduct under NUST Student Rules and Regulations. Students who make themselves guilty of academic dishonesty will be brought before a Disciplinary Committee and may be suspended from studying for a certain time or may be expelled. All students who are found guilty of academic dishonesty shall have an appropriate endorsement on their academic record, which will never be erased.
Dear Student

INTRODUCTORY NOTES

Below are few comments about some of questions. Read these comments carefully and let them guide you in preparing for the forth-coming end of semester examination.

- Generally, some students continue to give answers with the aid of a calculator and as a result do not show the steps leading to the answer. The steps leading to your answers are more important than just the answers. Moreover, you could gain marks for method even when the answer you came up with is incorrect. Therefore, it is recommended that you show all calculations.

- In some cases, inconsistencies were observed. Answers arising from inconsistent work do not attract any marks.

INSTRUCTIONS/REQUIREMENTS FOR ASSIGNMENTS

- Attempt all questions for the assignments
- Use blue or blank ink pen to complete the assignment
- Clearly show all your work
- Similar works attract zero mark for both two parties involved

ASSIGNMENT 1

Due date for Assignment 01: .................................................................

My Marker-tutor for this course is: JONAS AMUNYELA

Tel. no.: 061 207 2938

Email address: jamunyela@nust.na

My Student Support Officer for this course is: (PLEASE COMPLETE THIS PART!)
Address for emailed assignments: collassignments@nust.na
Students may send assignments via e-mail. Students should download the Electronic Assignment Book available in MSWord format from http://www.nust.na/?q=centres/coll/about-coll to complete assignments. Ensure that all information as requested on the assignment cover is completed and correct. Incorrect or incomplete information will prevent it from being accepted for marking.

After completion of the assignment, email the Electronic Assignment Book as an attachment to: collassignments@nust.na

Further note that students are allowed to submit late assignments, based on valid documentary evidence as per rule DE12 (b) of the COLL Yearbook 2018, provided late assignments are submitted within 7 days (including public holidays and weekends) after the due date of the assignment.

ASSIGNMENT 2
Due date for Assignment 02: .................................................................

My Marker-tutor for this course is: JONAS AMUNYELA

Tel. no.: 061 207 2938 .................................................................

Email address: jamunyela@nust.na .................................................................

My Student Support Officer for this course is: (PLEASE COMPLETE THIS PART!)

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ASSIGNMENT 02
This assignment covers unit 5 to 7

Assignment 2

Question 1 [24 marks]

1.1 Given the universal set \( U = \{a, b, c, d, e, f, g, h, i, l, m, n\} \) and set \( G = \{a, b, c, f, i\} \), \( M = \{c, d, e, f, g, h\} \)

1.1.1 Represent the above set elements into a Venn diagram below [4]

1.2 Shade the following regions on separate Venn diagram

a) \( G \) and not \( M \)
\[ G \cap \bar{M} \] [2]

b) not \( G \) or \( M \)

[2]
1.3 In the Venn diagram,

\[ U = \{ \text{people in the hotel} \} \]

\[ B = \{ \text{people who like bacon} \} \]

\[ E = \{ \text{people who like eggs} \} \]

1.3.1 How many people like bacon? [2]

30 people like bacon

1.3.2 How many people like eggs but not bacon? [2]

6 people
1.3.3 How many people like bacon and eggs? [2]  
14 people ✓ ✓

1.3.4 How many people are in the hotel? [2]  
47 people are in the hotel ✓ ✓

1.3.5 How many people like neither bacon nor egg? [2]  
11 people ✓ ✓

1.3.6 How many people like bacon or egg? [2]  
36 people ✓ ✓

1.3.7 What percentage of people like bacon or egg? [2]  
\[
\frac{36}{47} \times 100 = 77\%
\] ✓ ✓

Question 2 [25 marks]

2.1 Determine the values of the variables in the matrix equation below [4]

2.1.1 \[
\begin{pmatrix} x \\ -2 \\ 3 \end{pmatrix} \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 5 \\ 0 \end{pmatrix}
\] ✓

\[
2x + 3 = 5
\]

\[
x = 2
\]
\[ x = 1 \] 
\[ \therefore -4 + y = 0 \] 
\[ y = 4 \] 

2.1.2  
\[
\begin{pmatrix}
a & b \\
c & 0 \\
\end{pmatrix} - \begin{pmatrix}
2 & 5 \\
-3 & d \\
\end{pmatrix} = 2 \begin{pmatrix}
1 & a \\
b & -1 \\
\end{pmatrix}
\]  
\[ \therefore a - 2 = 2 \] 
\[ a = 4 \] 

\[ \therefore b - 5 = 2a \] 
\[ b - 5 = 8 \] 
\[ b = 13 \] 

\[ \therefore c + 3 = 2b \] 
\[ c = 26 - 3 \] 
\[ c = 23 \] 

2.2  Evaluate the following  

2.2.1  
\[ -2 \begin{vmatrix} 4 & -2 \\ 7 & 3 \end{vmatrix} \]
\[= -2(12 + 14) \quad \checkmark \]
\[= -52 \quad \checkmark \checkmark \]

2.2.2 \[\left( \begin{array}{c} x \\ w \end{array} \right) \left( \begin{array}{cc} 2 & 3 \\ \end{array} \right) \]
\[= \left( \begin{array}{c} 2x \checkmark \checkmark \\ 3x \checkmark \checkmark \\ 2w \checkmark \checkmark \\ 3w \checkmark \checkmark \end{array} \right) \]

2.2.3 \[\left( \begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array} \right) + 2 \left( \begin{array}{cc} 3 & 1 \\ 0 & -2 \end{array} \right) \cdot \left( \begin{array}{cc} 8 & 0 \\ 4 & -1 \end{array} \right) \]
\[= \left( \begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array} \right) + \left( \begin{array}{cc} 6 & 2 \\ 0 & -4 \end{array} \right) \cdot \left( \begin{array}{cc} 8 & 0 \\ 4 & -1 \end{array} \right) \]
\[= \left( \begin{array}{cc} 1 & 2 \\ -3 & 4 \end{array} \right) + \left( \begin{array}{cc} 56 & -2 \\ -16 & 4 \end{array} \right) \]
\[= \left( \begin{array}{cc} 57 & 0 \checkmark \checkmark \\ -19 \checkmark \checkmark & 8 \checkmark \checkmark \end{array} \right) \]

2.3 If \[\left( \begin{array}{cc} 2 & -3 \\ 0 & 4 \end{array} \right) + X = \left( \begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right), \] find \(X\)

\[X = \left( \begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array} \right) - \left( \begin{array}{cc} 2 & -3 \\ 0 & 4 \end{array} \right) \]
\[= \left( \begin{array}{cc} -1 & 3 \checkmark \checkmark \\ 0 \checkmark \checkmark & -3 \checkmark \checkmark \end{array} \right) \]
Question3 [15 marks]

3.1 Frans wants to earn $700 in interest, so he’ll have enough to buy a used car. She puts $2200 into an account that earns $2 \frac{1}{2}$% interest. How long will she need to leave her money in the account to earn $700 in interest? [3]

\[ I = 700, \quad p = N\$2200, \quad r = 0.025, \quad t = ? \]

\[ I = prt \]

\[ 700 = 2200 \times 0.025t \]

\[ 700 = 55t \]

\[ t = 12.7 \]

\[ t \approx 13 \]

3.2 A deposit of $1500 is made into a fund on March 18. The fund earns simple interest at 5%. On August 5, the interest rate changes to 4.5%. How much is in the fund on October 23? [6]

**Solution**

We determine the number of days between March 18 and August 5 = 217 – 77 = 140 and the number of days between August 5 and October 23 = 296 – 217 = 79

\[ S = \text{original deposit} + \text{interest for 140 days} + \text{interest for 79 days} \]

\[ S = 1500 + \left( 1500 \times 0.05 \times \frac{140}{365} \right) + \left( 1500 \times 0.045 \times \frac{79}{365} \right) \]

\[ S = 1500 + 28.77 + 14.61 \]

\[ S = 1543.38 \]
Hint: assume a year has 365 days

3.3 Amanda paid $500 for a table. After her birthday party she marked the table 61% above the cost price. If she then allowed the buyer a 20% discount, how much was the selling price? [2]

\[ 0.61 \times 500 = N$305 \text{ amount added on the cost price} \]

\[ 500 + 305 = N$805 \text{ price of Amanda's stable before discount} \]

*N$644 was the selling price ✓ ✓

3.4 Kamati wants to have a total of $3500 in three years so he can take a trip to Cape town. He finds an account that pays 5% interest compounded semi-annually.

3.4.1 How much should Kamati put into this account so that he will have $3500 at the end of three years? [4]

\[ A = N$3500, t = 3 \text{ years, } r = 0.05, n = 2, p = ? \]

\[ A = P(1 + i)^{nt} \] ✓

\[ 3500 = P(1 + 0.025)^6 \] ✓

\[ 3500 = 1.159693418p \]

\[ p = 3018.03 \] ✓

Kamati should put N$2611.75 into this account ✓

TOTAL MARKS 64