PORTFOLIO IN DISCRETE MATHEMATICS

FREDO BENDAL

BSIT-3N

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SYLLABUS .

MS101 – Discrete Mathematics Topical Outline

WEEK	LEARNING OUTCOMES	TOPIC
1	• Explain the QCU Vision and Mission; • Adhere to class rules and regulations; and • Understand the course requirements.	**Course Orientation and Course Introduction** • QCU Mission • QCU Vision • Course Overview • Grading System • Class Rules and Regulations • Course Requirements
2-4	• Describe the syntax and semantics of propositional logic • Illustrate the logical relationships of proposition using truth table. • Distinguish mathematical notations and symbols related to sets. • Perform the relations and operations on sets • Recognize the principles of Venn Diagrams.	**Logic and Sets** • Proposition • Elements of Propositional Logic • Connectives and Truth Table • Predicate and Quantifiers • Set Theories • Operations of Sets and its Computer Representation • Venn Diagrams
5	• Distinguish number theories and their properties. • Discover some relevant algorithms and its principles. • Apply appropriate number theories in solving problems.	**Application of Number Theory** • Divisor • Representation of Integers and Integer Algorithm
6	• Comprehend mathematical reasoning. • Determine mathematical arguments. • Construct mathematical arguments.	**Mathematical Reasoning** • Inference • Arguments • Theorems Induction
7	• Define basic counting principles.	**Counting Methods and Principles** • Basic Principles of Counting • Permutations and

MS101 – Discrete Mathematics Topical Outline

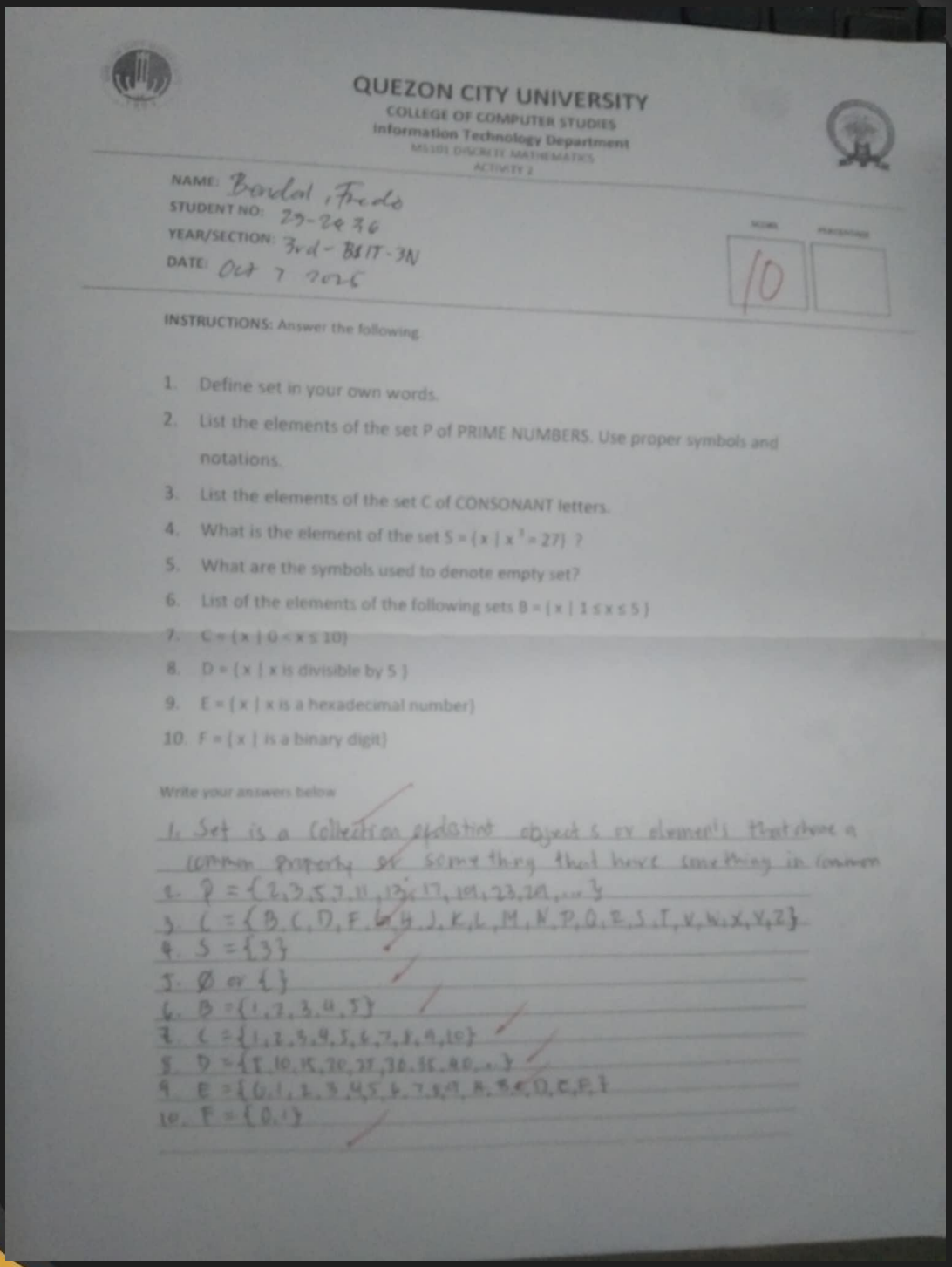
WEEK	LEARNING OUTCOMES	TOPIC
	• Apply them in some counting problems.	Combinations
8	• Analyze the concepts of probability • Determine different probabilities and its formula • Appreciate the uses of probabilities in solving real problems.	Probability • Introduction to Probability • Probability Distribution • Condition Probability • Probability of an Event
9	MIDTERM EXAMINATION	
10	• Analyze algorithms for some mathematical problems. • Distinguish different sorting algorithms • Recognize classical algorithms.	**Algorithms** • Introduction to Algorithms • Examples of Algorithms • Analysis of Algorithm Design
11	• Analyze the properties of relations. • Identify relations on some mathematical problems. • Demonstrate understanding of properties of relations.	**Relations** • Properties of Relations • Equivalence of Relations • Binary Relations • Matrix Relations
12-13	• Identify the domain, range, inverse and special types of functions. • Analyze algorithms using the concept of functions and function complexity. • Design simple logic circuits for a given switching function.	**Functions** • Definition, symbols and notation of functions. • Domain and Range Function • Two Equal Function and Inverse Function • Special Types of Functions • Composition or Product Function
14	• Describe a tree and its components.	**Trees** • Theory and Characterization of Trees

MS101 – Discrete Mathematics Topical Outline

WEEK	LEARNING OUTCOMES	TOPIC
	• Construct trees with specified components. • Recognize traversal of trees.	• Traversal of Trees
15	• Understand basic terminologies in Graph theory. • Identify different types of graphs and paths. • Draw appropriate type of graphs in solving basic problems.	**Graph Theory** • Introduction to Graph Theory • Path and Circuits
16-17	• Comprehend the laws of Boolean Algebra. • Solve Boolean Algebraic expressions. • Apply the concepts of Boolean Algebra to circuit design and programming. • Appreciate the importance of Boolean function in discrete math.	**BOOLEAN ALGEBRA** • Boolean Algebra Concepts • Boolean Expressions • Canonical Forms • Logic gates
18	FINAL EXAMINATION	

MIDTERM ACTIVITIES

SEATWORK :



QUEZON CITY UNIVERSITY
COLLEGE OF COMPUTER STUDIES
Information Technology Department
MS101 DISCRETE MATHEMATICS
ACTIVITY 2

NAME: Bordal, Fredo
STUDENT NO: 23-2936
YEAR/SECTION: 3rd - BSIT - 3N
DATE: Oct 7 2026

SCORE: 10 PERCENTAGE:

INSTRUCTIONS: Answer the following

1. Define set in your own words.
2. List the elements of the set P of PRIME NUMBERS. Use proper symbols and notations.
3. List the elements of the set C of CONSONANT letters.
4. What is the element of the set $S = \{x \mid x^3 = 27\}$?
5. What are the symbols used to denote empty set?
6. List of the elements of the following sets $B = \{x \mid 1 \leq x \leq 5\}$
7. $C = \{x \mid 0 < x \leq 10\}$
8. $D = \{x \mid x \text{ is divisible by } 5\}$
9. $E = \{x \mid x \text{ is a hexadecimal number}\}$
10. $F = \{x \mid x \text{ is a binary digit}\}$

Write your answers below

1. Set is a collection of distinct objects or elements that have a common property or something that have something in common
2. $P = \{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, \ldots\}$
3. $C = \{B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z\}$
4. $S = \{3\}$
5. $\emptyset$ or $\{\}$
6. $B = \{1, 2, 3, 4, 5\}$
7. $C = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
8. $D = \{5, 10, 15, 20, 25, 30, 35, 40, \ldots\}$
9. $E = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F\}$
10. $F = \{0, 1\}$

ASSIGNMENT :

MS101-DISCRETE MATHEMATICS

ASSIGNMENT #1

Year and Section: SBIT - 3N

September 23, 2025

Group No.____

Name of Members:

Baggay, Denzelle Audrie A.

Bendal, Fredo

Boholst, Keith Ashlee B.

Canceran, Maria Abigail U.

Cervantes, Nicko M.

Dula, Rafael B.

Lazaro, Lemuel Adrian R. - Lead Programmer

Panes, Veronica Mare

Perra, Ayen Clarence C.

Direction: Write a simple program that can determine the divisibility of a number by 2, 3, and 6.

1. **Divisibility of a number by 2.**

Source

Code

```
package calculator;
import java.util.Scanner;
public class divisible2 {
        public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Input 1st number: ");
        int number1 = scanner.nextInt();

        System.out.print("Input 2nd number: ");
        int number2 = scanner.nextInt();

        System.out.print("Input 3rd number: ");
        int number3 = scanner.nextInt();

        if (number1 % 2 == 0) {
            System.out.println("First Number: " + number1 + " is divisible by 2 with an answer of " + number1/2
    + " and remainder " + (number1 % 2) + "\n");
        } else {
            System.out.println("First Number: " + number1 + " is not divisible by 2 with an answer of " +
    number1/2 + " and remainder " + (number1 % 2) + "\n");
        }

        if (number2 % 2 == 0) {
            System.out.println("Second Number: " + number2 + " is divisible by 2 with an answer of " +
    number2/2 + " and remainder " + (number2 % 2) + "\n");
        } else {
            System.out.println("Second Number: " + number2 + " is not divisible by 2 with an answer of " +
    number2/2 + " and remainder " + (number2 % 2) + "\n");
        }

        if (number3 % 2 == 0) {
            System.out.println("Third Number: " + number3 + " is divisible by 2 with an answer of " + number3/2
    + " and remainder " + (number3 % 2) + "\n");
        } else {
            System.out.println("Third Number: " + number3 + " is not divisible by 2 with an answer of " +
    number3/2 + " and remainder " + (number3 % 2) + "\n");
        }
        scanner.close();
    }
}
```

Screenshot

Screenshot

Source

Codes

Code:

Screenshot Output:

```
Input 1st number: 8
Input 2nd number: 9
Input 3rd number: 12
First Number: 8 is divisible by 2 with an answer of 4 and remainder 0

Second Number: 9 is not divisible by 2 with an answer of 4 and remainder 1

Third Number: 12 is divisible by 2 with an answer of 6 and remainder 0
```

2. Divisibility by 3.

Source Code:

```
package calculator;
import java.util.Scanner;
public class divisible3 {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);
System.out.print("Input 1st number: ");
int number1 = scanner.nextInt();

System.out.print("Input 2nd number: ");
int number2 = scanner.nextInt();

System.out.print("Input 3rd number: ");
int number3 = scanner.nextInt();

if (number1 % 3 == 0) {
System.out.println("First Number: " + number1 + " is divisible by 3 with an answer of " + number1/3 + " and
remainder " + (number1 % 3) + "\n");
} else {
System.out.println("First Number: " + number1 + " is not divisible by 3 with an answer of " + number1/3 + "
and remainder " + (number1 % 3) + "\n");
}

if (number2 % 3 == 0) {
System.out.println("Second Number: " + number2 + " is divisible by 3 with an answer of " + number2/3 +" and
remainder " + (number2 % 3) + "\n");
} else {
System.out.println("Second Number: " + number2 + " is not divisible by 3 with an answer of " + number2/3 +
" and remainder " + (number2 % 3) + "\n");
}

if (number3 % 3 == 0) {
System.out.println("Third Number: " + number3 + " is divisible by 3 with an answer of "
remainder " + (number3 % 3) + "\n");
} else {
```

```
System.out.println("Third Number: " + number3 + " is not divisible by 3 with an answer of " + number3/3 + "
and remainder " + (number3 % 3) + "\n");
}
scanner.close();
}
```

Screenshot

Screenshot

Source Codes

Code:

```
package calculator;
import java.util.Scanner;
public class divisible3 {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);

System.out.print("Input 1st number: ");
int number1 = scanner.nextInt();

System.out.print("Input 2nd number: ");
int number2 = scanner.nextInt();

System.out.print("Input 3rd number: ");
int number3 = scanner.nextInt();

if (number1 % 3 == 0) {
System.out.println("First Number: " + number1 + " is divisible by 3 with an answer of " + number1/3 + " and remainder " + (number1 % 3) + "\n");
} else {
System.out.println("First Number: " + number1 + " is not divisible by 3 with an answer of " + number1/3 + " and remainder " + (number1 % 3) + "\n");
}

if (number2 % 3 == 0) {
System.out.println("Second Number: " + number2 + " is divisible by 3 with an answer of " + number2/3 + " and remainder " + (number2 % 3) + "\n");
} else {
System.out.println("Second Number: " + number2 + " is not divisible by 3 with an answer of " + number2/3 + " and remainder " + (number2 % 3) + "\n");
}

if (number3 % 3 == 0) {
System.out.println("Third Number: " + number3 + " is divisible by 3 with an answer of " + number3/3 + " and remainder " + (number3 % 3) + "\n");
} else {
System.out.println("Third Number: " + number3 + " is not divisible by 3 with an answer of " + number3/3 + " and remainder " + (number3 % 3) + "\n");
}
scanner.close();
}
```

Screenshot Output

```
Input 1st number: 8
Input 2nd number: 9
Input 3rd number: 12
First Number: 8 is not divisible by 3 with an answer of 2 and remainder 2

Second Number: 9 is divisible by 3 with an answer of 3 and remainder 0

Third Number: 12 is divisible by 3 with an answer of 4 and remainder 0
```

3. Divisibility by 6.

Source Code

```
package calculator;
import java.util.Scanner;
public class divisible6 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Input 1st number: ");
        int number1 = scanner.nextInt();

        System.out.print("Input 2nd number: ");
        int number2 = scanner.nextInt();

        System.out.print("Input 3rd number: ");
        int number3 = scanner.nextInt();
        if (number1 % 6 == 0) {
            System.out.println("First Number: " + number1 + " is divisible by 6 with an answer of " + number1/6 + " and
remainder " + (number1 % 6) + "\n");
        } else {
            System.out.println("First Number: " + number1 + " is not divisible by 6 with an answer of " + number1/6 + "
and remainder " + (number1 % 6) + "\n");
        }

        if (number2 % 6 == 0) {
            System.out.println("Second Number: " + number2 + " is divisible by 6 with an answer of " + number2/6 + " and
remainder " + (number2 % 6) + "\n");
        } else {
            System.out.println("Second Number: " + number2 + " is not divisible by 6 with an answer of " + number2/6 +
" and remainder " + (number2 % 6) + "\n");
        }

        if (number3 % 6 == 0) {
            System.out.println("Third Number: " + number3 + " is divisible by 6 with an answer of " + number3/6 + " and
remainder " + (number3 % 6) + "\n");
        } else {
            System.out.println("Third Number: " + number3 + " is not divisible by 6 with an answer of " + number3/6 + "
and remainder " + (number3 % 6) + "\n");
        }
        scanner.close();
    }
}
```

Codes

Screenshot

Screenshot Source Code:

```
package calculator;
import java.util.Scanner;
public class divisible6 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Input 1st number: ");
        int number1 = scanner.nextInt();

        System.out.print("Input 2nd number: ");
        int number2 = scanner.nextInt();

        System.out.print("Input 3rd number: ");
        int number3 = scanner.nextInt();
        if (number1 % 6 == 0) {
            System.out.println("First Number: " + number1 + " is divisible by 6 with an answer of " + number1/6 + " and remainder " + (number1 % 6) + "\n");
        } else {
            System.out.println("First Number: " + number1 + " is not divisible by 6 with an answer of " + number1/6 + " and remainder " + (number1 % 6) + "\n");
        }

        if (number2 % 6 == 0) {
            System.out.println("Second Number: " + number2 + " is divisible by 6 with an answer of " + number2/6 + " and remainder " + (number2 % 6) + "\n");
        } else {
            System.out.println("Second Number: " + number2 + " is not divisible by 6 with an answer of " + number2/6 + " and remainder " + (number2 % 6) + "\n");
        }

        if (number3 % 6 == 0) {
            System.out.println("Third Number: " + number3 + " is divisible by 6 with an answer of " + number3/6 + " and remainder " + (number3 % 6) + "\n");
        } else {
            System.out.println("Third Number: " + number3 + " is not divisible by 6 with an answer of " + number3/6 + " and remainder " + (number3 % 6) + "\n");
        }
        scanner.close();
    }
}
```

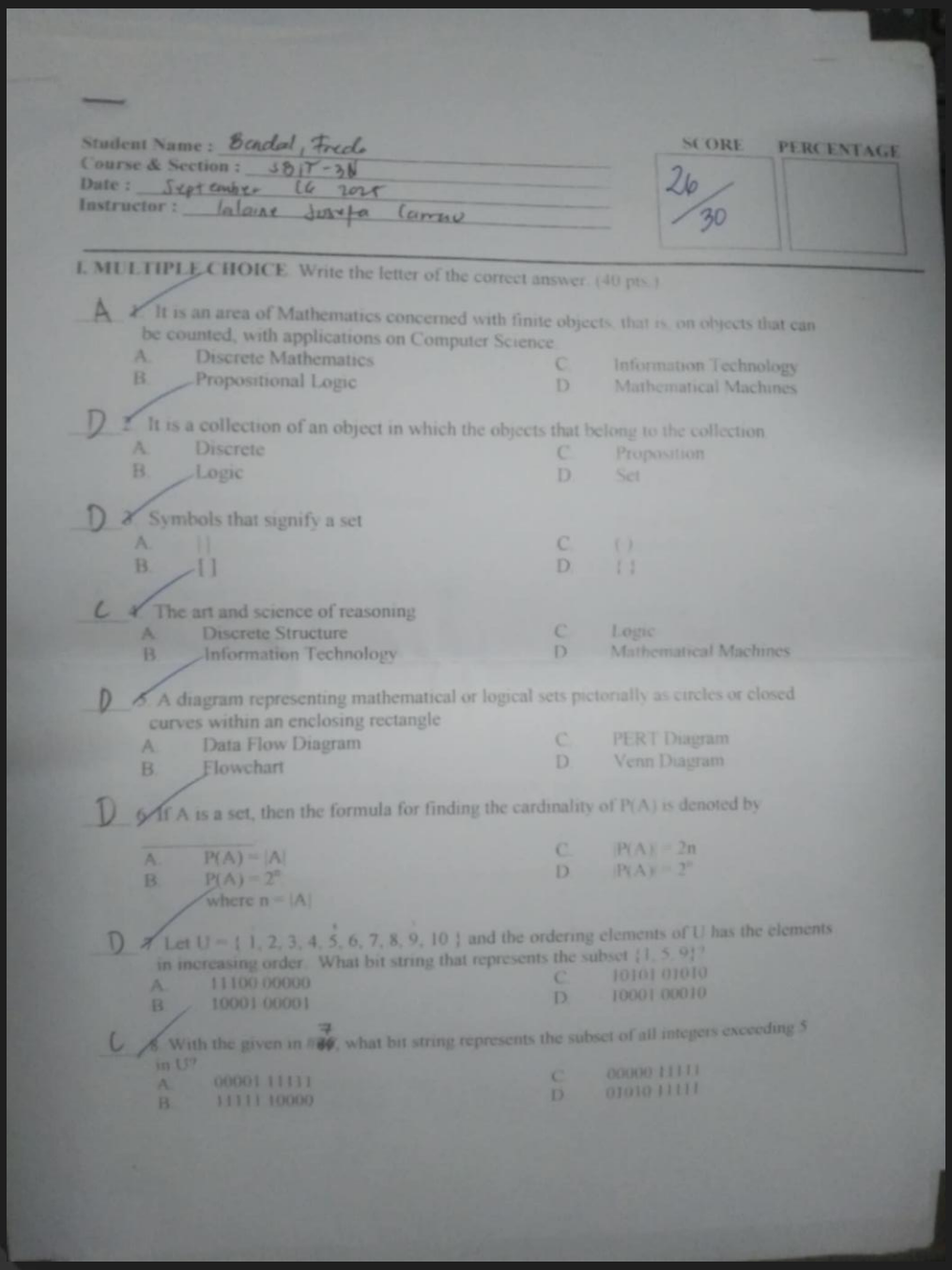
Screenshot Output

```
Input 1st number: 8
Input 2nd number: 9
Input 3rd number: 12
First Number: 8 is not divisible by 6 with an answer of 1 and remainder 2

Second Number: 9 is not divisible by 6 with an answer of 1 and remainder 3

Third Number: 12 is divisible by 6 with an answer of 2 and remainder 0
```

LONG QUIZ :



Student Name : Bendal, Freda
Course & Section : SBIT-3B
Date : September 16 2025
Instructor : Valaire Jurefa Carino

SCORE: 26/30
PERCENTAGE:

I. MULTIPLE CHOICE. Write the letter of the correct answer. (40 pts.)

A 1. It is an area of Mathematics concerned with finite objects, that is, on objects that can be counted, with applications on Computer Science.
A. Discrete Mathematics
B. Propositional Logic
C. Information Technology
D. Mathematical Machines

D 2. It is a collection of an object in which the objects that belong to the collection
A. Discrete
B. Logic
C. Proposition
D. Set

D 3. Symbols that signify a set
A. | |
B. [ ]
C. ( )
D. { }

C 4. The art and science of reasoning
A. Discrete Structure
B. Information Technology
C. Logic
D. Mathematical Machines

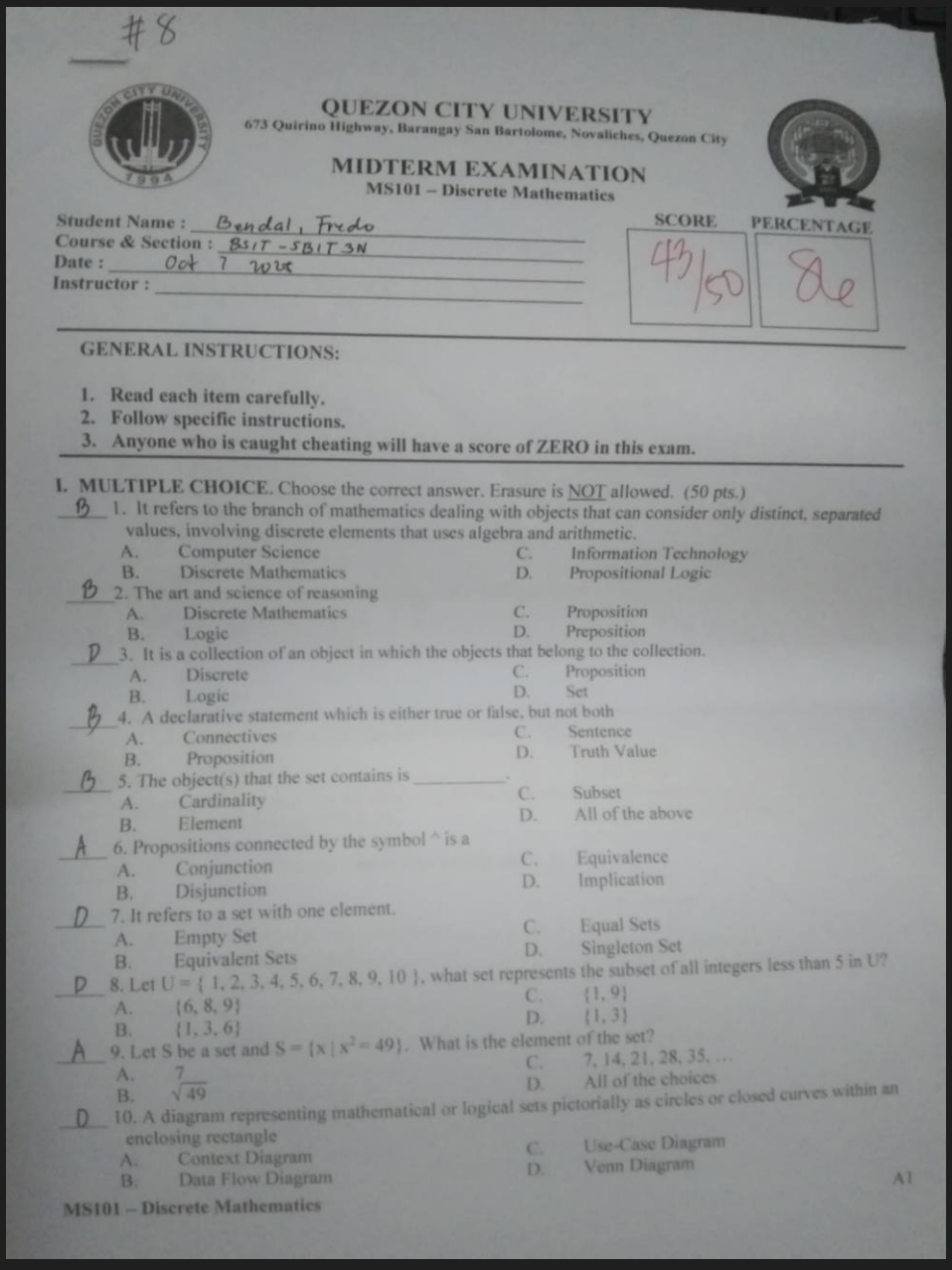
D 5. A diagram representing mathematical or logical sets pictorially as circles or closed curves within an enclosing rectangle
A. Data Flow Diagram
B. Flowchart
C. PERT Diagram
D. Venn Diagram

D 6. If A is a set, then the formula for finding the cardinality of P(A) is denoted by
A. $P(A) = |A|$
B. $P(A) = 2^n$ where $n = |A|$
C. $|P(A)| = 2n$
D. $|P(A)| = 2^n$

D 7. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 } and the ordering elements of U has the elements in increasing order. What bit string that represents the subset {1, 5, 9}?
A. 11100 00000
B. 10001 00001
C. 10101 01010
D. 10001 00010

C 8. With the given in #7, what bit string represents the subset of all integers exceeding 5 in U?
A. 00001 11111
B. 11111 10000
C. 00000 11111
D. 01010 11111

MIDTERM EXAM :



#8

QUEZON CITY UNIVERSITY
673 Quirino Highway, Barangay San Bartolome, Novaliches, Quezon City

MIDTERM EXAMINATION
MS101 – Discrete Mathematics

Student Name : Bendal, Fredo
Course & Section : BSIT-5BIT3N
Date : Oct 7 '22
Instructor :

SCORE	PERCENTAGE
43/50	86

GENERAL INSTRUCTIONS:

1. Read each item carefully.
2. Follow specific instructions.
3. Anyone who is caught cheating will have a score of ZERO in this exam.

I. MULTIPLE CHOICE. Choose the correct answer. Erasure is NOT allowed. (50 pts.)

B 1. It refers to the branch of mathematics dealing with objects that can consider only distinct, separated values, involving discrete elements that uses algebra and arithmetic.
A. Computer Science C. Information Technology
B. Discrete Mathematics D. Propositional Logic

B 2. The art and science of reasoning
A. Discrete Mathematics C. Proposition
B. Logic D. Preposition

D 3. It is a collection of an object in which the objects that belong to the collection.
A. Discrete C. Proposition
B. Logic D. Set

B 4. A declarative statement which is either true or false, but not both
A. Connectives C. Sentence
B. Proposition D. Truth Value

B 5. The object(s) that the set contains is _____.
A. Cardinality C. Subset
B. Element D. All of the above

A 6. Propositions connected by the symbol ^ is a
A. Conjunction C. Equivalence
B. Disjunction D. Implication

D 7. It refers to a set with one element.
A. Empty Set C. Equal Sets
B. Equivalent Sets D. Singleton Set

D 8. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 }, what set represents the subset of all integers less than 5 in U?
A. {6, 8, 9} C. {1, 9}
B. {1, 3, 6} D. {1, 3}

A 9. Let S be a set and S = $\{x \mid x^2 = 49\}$. What is the element of the set?
A. 7 C. 7, 14, 21, 28, 35, ...
B. $\sqrt{49}$ D. All of the choices

D 10. A diagram representing mathematical or logical sets pictorially as circles or closed curves within an enclosing rectangle
A. Context Diagram C. Use-Case Diagram
B. Data Flow Diagram D. Venn Diagram

A1

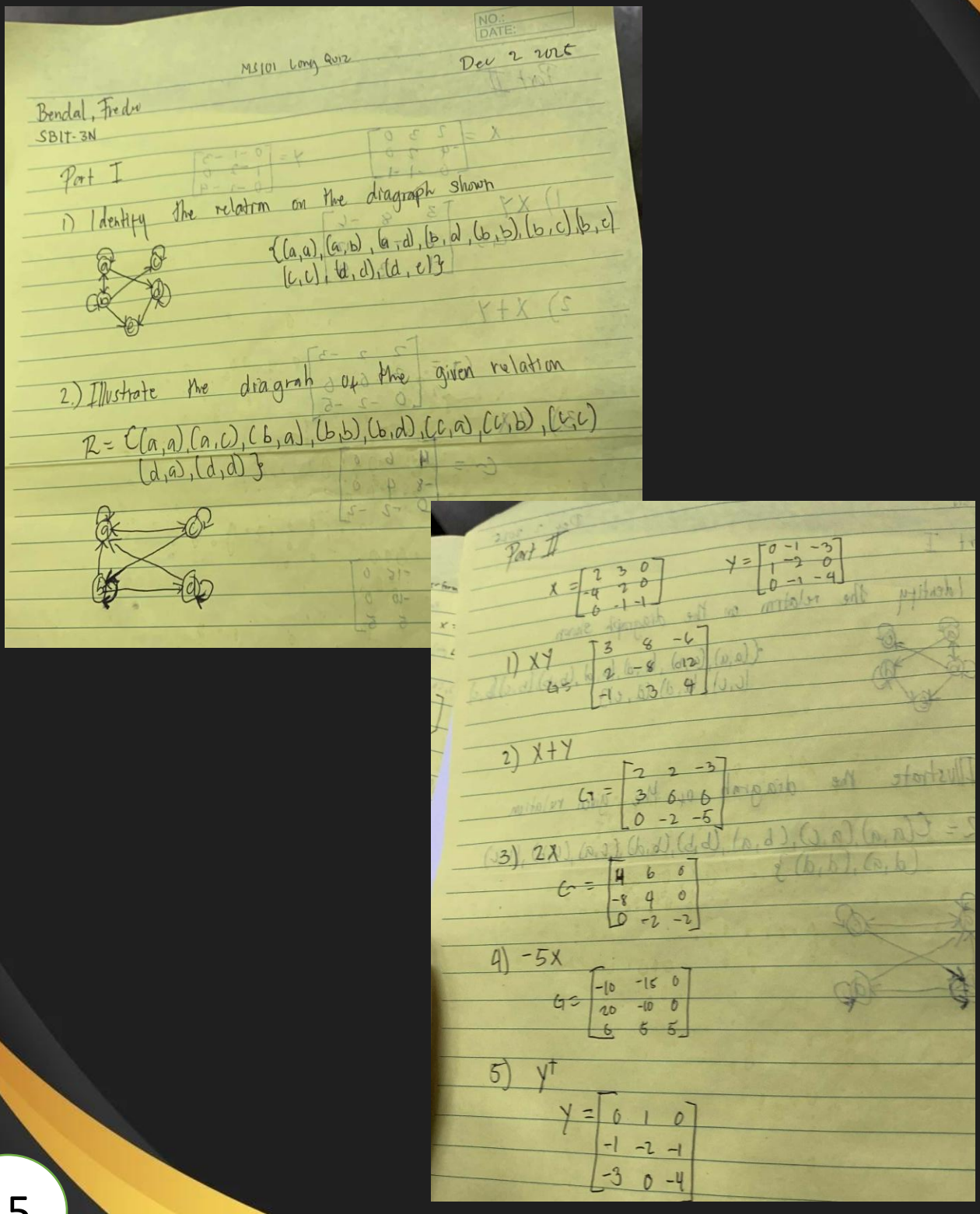
MS101 – Discrete Mathematics

FINALS ACTIVITIES

SEATWORK :

ASSIGNMENT :

LONG QUIZ :



MS101 Long Quiz

Dec 2 2025

Bendal, Fredu

SBIT-3N

Part I

1) Identify the relation on the diagraph shown

{(a,a), (a,b), (a,d), (b,a), (b,b), (b,c), (b,e), (c,c), (d,d), (d,e)}

2) Illustrate the diagraph of the given relation

R = {(a,a), (a,c), (b,a), (b,b), (b,d), (c,a), (c,b), (c,c), (d,a), (d,d)}

Part II

$$X = \begin{bmatrix} 2 & 3 & 0 \\ -4 & 2 & 0 \\ 0 & -1 & -1 \end{bmatrix} \qquad Y = \begin{bmatrix} 0 & -1 & -3 \\ 1 & -2 & 0 \\ 0 & -1 & -4 \end{bmatrix}$$

1) XY

$$G = \begin{bmatrix} 3 & 8 & -6 \\ 2 & -8 & 12 \\ -1 & 3 & 4 \end{bmatrix}$$

2) X+Y

$$G = \begin{bmatrix} 2 & 2 & -3 \\ 3 & 6 & 6 \\ 0 & -2 & -5 \end{bmatrix}$$

3) 2X

$$G = \begin{bmatrix} 4 & 6 & 0 \\ -8 & 4 & 0 \\ 0 & -2 & -2 \end{bmatrix}$$

4) -5X

$$G = \begin{bmatrix} -10 & -15 & 0 \\ 20 & -10 & 0 \\ 0 & 5 & 5 \end{bmatrix}$$

5) Y^T

$$Y = \begin{bmatrix} 0 & 1 & 0 \\ -1 & -2 & -1 \\ -3 & 0 & -4 \end{bmatrix}$$

FINAL EXAM :