PROGRAMME	**DIPLOMA IN INFORMATION TECHNOLOGY**
MODULE	**PROGRAMMING 2A**
MODULE CODE	**PRG 210**
MODULE NQF LEVEL	**6**
TEST/EXAM	**EXAM MEMO**
SEMESTER	**1ST**
DATE WRITTEN	**20 JUNE**

TOTAL MARKS	**100**
DURATION	**2 HOURS**
PASS MARK	**50%**
WEIGHTING	**60%**
EXAMINER	**JOHN ALLOZIEM**
MODERATOR	**THABISO MATHEBULA**

This question paper consists of **9** pages including the cover page.

REQUIREMENTS:

Learner Requirements: Stationery and Examination Answer booklet
Equipment Requirements: Computer installed with java software.

This paper consists of:

1.	Section A:	**20 marks**
2.	Section B:	**42 marks**
3.	Section C:	**38 marks**

ALL sections are **COMPULSORY**. It is in your own interest to write legibly and to present your work neatly.

PLEASE READ THE ASSESSMENT RULES AND REGULATIONS THAT FOLLOW

Learners are warned that contravening any of the examination rules or disobeying the instructions of an invigilator could result in the examination being declared invalid. Disciplinary measures will be taken which may result in the students' expulsion from Damelin.

ASSESSMENT RULES AND REGULATIONS

Please ensure that you have read and fully understand the following assessment rules and regulations prior to commencing with your assessment:

1. To be permitted access to the examination, a learner must arrive with:
   - an Identity Document or other official proof of identity (for example,
   - a student card, passport or driver's licence card with photo); and
   - the required exam stationery.
2. No learner may enter the examination room more than 30 minutes after the examination sitting has commenced and no candidate may leave the room less than one hour after the examination sitting has commenced.
3. No extra time will be allowed should a student arrive late.
4. All learners must sign the *Attendance Register* for the examination on arrival.
5. It is the responsibility of learners to familiarise themselves with the examination rules prior to sitting for the examination.
6. All examinations are to be written on the date and time officially stipulated by the College.
7. It is the responsibility of learners to ensure that they are writing the correct paper and that the question paper is complete
8. Cell phones must be switched *off* prior to entering the exam venue. Cell phones and wallets may be placed under candidates' chairs rather than at the front of the room.
9. Learners may not handle cell phones or wallets during the exam.
10. No weapon of any description may be taken into the assessment room.
11. All personal belongings are to be placed at the front of the examination room. Personal belongings brought to the examination are at the owner's risk.
12. Smoking is not permitted and learners will not be allowed to leave the examination room in order to smoke
13. Once the examination has commenced, all conversation of any form between candidates must cease until after candidates have left the room, after the examination.
14. *Only* the official College examination book, as supplied by the College, may be used.
15. Learners must ensure that their student number is written on the answer book.
16. Learners are responsible for ensuring that they follow the instructions in the examination for submitting their answers.
17. Please read the instruction appearing on the examination paper carefully
18. The number of every question must be clearly indicated at the top of every answer.
19. No pages may be torn out of the answer book. All question papers and scrap paper must be handed to the invigilator after the examination.
20. Learners finishing earlier are to leave the examination room as quietly as possible on the instruction of the invigilator and may not talk until outside the building where the examination is being written.
21. Only under exceptional circumstances will a learner be permitted to leave the examination room during the examination, and if the invigilator gives permission. An invigilator must accompany the learner. Only one learner at a time may be absent from the examination room.
22. Candidates may not act dishonestly in any respect.

SECTION A:
MULTIPLE CHOICE QUESTIONS
Select the correct answer from the options available.
In the provided answer book, write down the question number and the letter of the correct answer next to it.
For example: 1.1 D
Each question is worth one (1) marks.

QUESTION 1 **(10 marks)**

1.1 Which of the following is a valid declaration of an object of class Box? (1)

A. Box obj = new Box(); √
B. Box obj = new Box;
C. obj = new Box();
D. new Box obj;

1.2 Which of these cannot be used for a variable name in Java? (1)

A. identifier
B. keyword √
C. identifier & keyword
D. none of the mentioned

1.3 With x = 0, which of the following are legal lines of Java code for changing the value of x to 1? (1)

1. x++;
2. x = x + 1;
3. x += 1;
4. x =+ 1;

A. 1, 2 & 3
B. 1 & 4
C. 1, 2, 3 & 4 √
D. 3 & 2

1.4 What is the output of this program? (1)

```
class increment
{
   public static void main(String args[])
   {
      int g = 3;
      System.out.print(++g * 8);
   }
}
```

A. 25

B. 24
C. 32 √
D. 33

1.5 Which of these is an incorrect array declaration? (1)
A. int arr[] = new int[5].
B. int [] arr = new int[5].
C. int arr[] = new int[5].
D. int arr[] = int [5] new √

1.6 Which one is a valid declaration of a boolean? (1)
A. boolean b1 = 0;
B. boolean b2 = 'false';
C. boolean b3 = false; √
D. boolean b5 = no;

1.6 Which is a valid declaration of a String? (1)
A. String s1 = null; √
B. String s2 = 'null';
C. String s3 = (String) 'abc';
D. String s4 = (String) '\ufeed';

1.7 Which of these method of class String is used to extract a single character from a String object? (1)
A. CHARAT()
B. chatat()
C. charAt()√
D. ChatAt()

1.8 Which of these operators can be used to concatenate two or more String objects? (1)
A. + √
B. +=
C. &
D. ||

1.9 Which of this method of class StringBuffer is used to get the length of the sequence of characters? (1)
A. length()√
B. capacity()
C. Length()
D. Capacity()

1.10 Which of these method of class String is used to compare two String objects for their equality? (1)

A. equals() √
B. Equals()
C. isequal()
D. Isequal()

TRUE / FALSE QUESTIONS
Indicate your answer on the Answer book.
provided. For example: 2.1 FALSE
Each question is worth two (2) marks.

QUESTION 2 **(10 marks)**

2.1 Everything in Java (except the primitive data types) is an object. True √ (2)

2.2 object and instance are never used interchangeably. False √ (2)

2.3 The data, or variables, defined within a class are called instance variables. True √ (2)

2.4 Constructors have no return type. True √ (2)

2.5 Everything in Java (except the primitive data types) is an object. True √ (2)

QUESTION 3 **(20 Marks)**

3.1	Define the following programming terminology:	
3.1.1	**Application software** – a program that performs a task for the user(such as calculating and producing paycheck, etc.)	(2)
3.1.2	**Variable –** a named computer memory location [the value therein may differ from time to time]	(2)
3.1.3	- **Syntax error**– misuse of language.	(2)
3.1.4	- **Logic error**– an error that occurs when a program compiles successfully but produces an error during execution.	(2)
3.1.5	**Attributes –** are the characteristics that define an object.	(2)
3.2	Methods declared as **static** have several restrictions, what are the restrictions Answer: Pg 54	(6)

	■ They can only call other **static** methods. √√ ■ They must only access **static** data. √√ ■ They cannot refer to **this** or **super** in any way. √√	
3.3	Write down two different methods of adding comments to java code. Answer: Pg 13 To write blog comments you use "/* --comments--*/" √√ You then use "//--Single line comments--"// √√ Outcome: multiple outcome including Add comments to a Java class	(4)

SECTION B:
QUESTION 4 **(22 Marks)**

4.1 Study the programs below (class Box and class BoxDemo6) and write down result that will print on the java standard output. (10)

```
class Box {
double width;
double height;
double depth;

Box() {
System.out.println("Constructing Box");
width = 5;
height = 10;
depth = 3;
}

double volume() {
return width * height * depth;
}
}

class BoxDemo6 {
public static void main(String args[]) {

Box mybox1 = new Box();
Box mybox2 = new Box();
Box mybox3 = new Box();
double vol;

vol = mybox1.volume();
System.out.println("Volume for mybox1 is " + vol);

vol = mybox2.volume();
System.out.println("Volume for mybox2 is " + vol);
}
}
```

Answer:
Constructing Box √√
Constructing Box √√
Constructing Box √√
Volume for mybox1 is 150.0 √√
Volume for mybox2 is 150.0 √√

Outcome: Create and call constructors with parameters

4.2 Study the program below and write the corrections necessary to enable the code to produce an output. Write down the expected output. (12)

```
class UseStatic {
        static int a = 3;
        static int b;
        int c = 5;
        double n;
static void meth(   x)
{
    System.out.println("x = " + x);
    System.out.println("a = " + a);
    System.out.println("b = " + b);
    System.out.println("c = " + c);
}

static
{
    System.out.println("Static block initialized.");
    b = a * 4;
}
public static void main(String args[]) {
    meth(42);
    n = 3.5;
    System.out.println("n = " + n);
}
}
```

Answer:

```
class UseStatic {
    static int a = 3;
    static int b;
    static int c = 5; √√
    static double n; √√
    static void meth(int x) √√
{
    System.out.println("x = " + x);
    System.out.println("a = " + a);
    System.out.println("b = " + b);
    System.out.println("c = " + c);
```

```
}

static
{
    System.out.println("Static block initialized.");
    b = a * 4;
}

public static void main(String args[]) {
    meth(42);
    n = 3.5;
    System.out.println("n = " + n);
}
}
```

Output:
Static block initialized. √
x = 42 √
a = 3 √
b = 12 √
c = 5 √
n = 3.5 √

Outcome:

SECTION C: PRACTICALS
QUESTION 5 **(38 Marks)**

5.1 Write a program to calculate the area of rectangle. The program should make use of a constructor and the 'this' keyword. (Area of a rectangle = Length * Breadth). The length of the rectangle is 6cm and the breadth is 5cm. Overload the constructor and use it to calculate the volume of a cuboid having dimensions as 4cm, 6cm and 10cm for the length, breath and height respectively. (Volume of a cuboid = Length * Breadth* Height) (18)

Answer: Pg 49

```
class RectA{ √

int le; √
int wi; √
int hi; √

public RectA(int x, int y){
this.le = x;
this.wi = y;
System.out.println(x*y);
} √√√√

public RectA(int x, int y, int z){
```

	this.le = x;
	this.wi = y;
	this.hi = z;
	System.out.println(x*y*z);
	} √√√√√
	
	public static void main(String[]args){
	
	RectA rc = new RectA(5,6); √√
	RectA rc2 = new RectA(4,6,10); √√√
	}
	}
	Outcome: Create and call constructors with parameters	

5.2	Write a simple java gui programme that will prompt a user to enter the radius of circle in a JoptionPane. The value should be used to calculate the area. The output should be displayed on a Message dialog.
	Use the formula: Area = radius*radius*3.14.
	Answer: SU 2
	import javax.swing.JOptionPane; √√
	
	public class JOptionPaneTest { √
	public static void main(String[] args) { √
	String radiusStr; √
	
	double radius, area; √√
	// Read input String from dialog box
	radiusStr = JOptionPane.showInputDialog("Enter the radius of the circle"); √√√
	
	radius = Double.parseDouble(radiusStr); √√√√
	area = radius*radius*3.14; √√√
	
	__JOptionPane.showMessageDialog(null, "The area is " + area); √√√
	
	}
	}
	Outcome: Use the JOptionPane class to accept GUI input;• Perform arithmetic
		(20)

∞*End of Question Paper*∞