



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION: Bachelor of Computer Science , Bachelor of Computer Science in Cyber Security, Bachelor of Informatics	
QUALIFICATION CODE: 07BACS, 07BCCS, 07BAIF	LEVEL: 5
COURSE: Programming 1	COURSE CODE: PRG510S
DATE: June 2019	PAPER: THEORY
DURATION: 2 Hours	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER	MR HERMAN KANDJIMI MR SIMON H. MUCHINENYIKA MS NDINELAGO NASHANDI MR STEVEN TJIRASO MR JEREMIAH LUMBASI DR CAMERON MACRAE MR ELIAZER MBAEVA MR PADURI VEERAB
MODERATOR:	MR COLIN STANLEY

THIS EXAMINATION PAPER CONSISTS OF 6 PAGES
(INCLUDING THIS FRONT PAGE)

INSTRUCTIONS

1. Answer **all** questions.
2. Total marks per question are given in [].
3. **Read** and **understand** the question carefully before attempting to answer
4. When writing take the following into account: The style should inform than impress, it should be formal, in third person, paragraphs set out according to ideas or issues and the paragraphs flowing in a logical order. Information provided should be brief and accurate.
5. Please, ensure that your writing is **legible, neat and presentable**.

PERMISSIBLE MATERIALS

6. Calculator.

1. Copy and complete the Table below. [10]

Data type	Value	Declarations and assignment
	25	
	'5'	
	true	
	"This class is dope!!"	
	7789.8f	

2. In the table below, column A has Java statements/expressions and column B has possible outcomes or errors corresponding to each statement. [10]

Column A	Column B
1. System.out.println("1 + 2 = " + "1"+"2');	A. true
2. System.out.printf("Name: %s","Denzil");	B. 1 + 2 = 12
3. int [] evenNumbers = {2,4,"Six",8};	C. 1 + 2 = 1+2
4. System.out.println(5 > 3 5 != 3);	D. Name: Denzil
5. System.out.println((5 < 3) != (5 == 3));	E. Syntax error
6. System.out.printf("Name: %s"+"Denzil");	F. Runtime error: ArrayIndexOutOfBoundsException
7. System.out.println("1 + 2 = " + (1+2));	G. Runtime error: MissingFormatArgumentException
8. int [] vowels = {'a','e','i','o','u'}; System.out.println(vowels[5]);	H. u
9. int [] vowels = {'a','e','i','o','u'}; System.out.println(vowels[4]);	I. 1 + 2 = 3
10. System.out.println("1 + 2 = " + ((2>1)?"1+2":"2"));	J. false

Match each statement in Column A with an outcome or error in Column B. (e.g. 2.1, A)

3. What is the difference between the following:
- A) Parameters and Arguments [3]
- B) Primitive and Non-Primitive data types [3]
4. Describe and relate the following terms : Problem, Algorithm, and Flowchart [4]

5. What is the output of the following program and show all your workings? [6]

```
public class Exam_Q4
{
    public static void main(String[] args)
    {
        System.out.println(mystery(5));
    }
    public static int mystery(int n)
    {
        if (n <= 1)
            return 1;
        else
            return ( mystery(n - 1) + n );
    }
}
```

6. A) Rewrite the following piece of code using a **for** loop. [4]

```
3 public static void display(int[] ages){
4     int index = 0;
5     do{
6         System.out.println(ages[index]);
7         index++;
8     }while (index < ages.length);
9 }
```

B) Rewrite the following code snippet using a **nested-if** statement. [5]

```
if(number%2 == 0 && number > 50){
    System.out.println(number+" is an EVEN number above 50);
}else if(number%2 == 0 && number <= 50){
    System.out.println(number+" is an EVEN number below or equals to 50);
}else if(number%2 != 0 && number > 50){
    System.out.println(number+" is an ODD number above 50);
}else{
    System.out.println(number+" is an ODD number below or equals to 50);
}
```

7. Create a **method** that takes in three arrays, one for item names, one for item quantity and a last one for cost per unit. The method should then calculate the total for each item using the quantity and cost per unit, you should the calculate the sub-total and finally the total which includes 15% VAT on top of the sub-total. [10]

Use the below format a sample for you print out:

item	QTY	Cost/item	Total
Bread	2	6.50	13.00
Sweets	10	0.50	5.00
		Sub-Total	N\$ 18.00
		Vat	N\$ 2.70
		Total Bill.	N\$ 20.70

8. Examine the code snippet below and answer the questions that follow:

```
5 public static void main(String[] args) {
6     Scanner input = new Scanner(System.in);
7     int num = 0,result = 1; //Variable declarations
8
9     System.out.print("Enter a number :");
10    num = input.nextInt();
11
12    boolean isValid = (num>0)?true:false;
13
14    System.out.print("Result = ");
15    if(isValid){
16        for(int i = num;i>0;i--){
17            result = result * i;
18            if(i != 1)
19                System.out.print(i+" x ");
20            else
21                System.out.print(i +" = ");
22        }
23        System.out.println(result);
24    }else{
25        System.out.println("Calculations not allowed for negative numbers!!");
26    }
27    //difference calculation below
28
29 }
```

- A) What does line 9 do, and how is this called in Programming? [2]
- B) Explain what happens line 10? [2]
- C) What does line 12 do, and how is this known in Java? [2]
- D) By making use of 5 as user input, briefly explain what is the purpose of this whole code snippet? [3]
- E) Line 27 provides a comment that requires you to add a new piece of code for calculating the difference, provide this requested code.[Hint: the difference should be calculated between the num and result, use Math.abs() to make sure the outcome is positive] [3]

9. Examine the code snippet below, identify line with errors and correct them. Finally indicate the output of the code snippet.

```
37 int numericLetters = 'C'%2;
38 int Years[] = {1990,2005,"2015"};
39 String[] namibianPresidents = {"Sam Nujoma","Hifikepunye Pohamba","Zuma"};
40 String current = 'Hage Geingob'
41 namibianPresidents[2] = current;
42
43 String countrySlogan = "Namibia Land of opportunities";
44 countrySlogan = countrySlogan.substring(0,16);
45 System.out.println(countrySlogan.concat("the brave"));
46
47 for (int i = 0; i < Years.length; i++) {
48     System.out.printf("His excellency Dr %s came to office in %d %n",
49         namibianPresidents[i],Years[i] );
50 }
```

A) Line with errors and Solutions: [4]

B) Code output [4]

10. In efforts to reduce road accidents in Namibia, the Namibia Police Traffic division has come of with measures to reduce speeding by enforcing heavy fines on the drivers caught disobeying the law. The table below gives an overview of the fines relative to the speed driven, Additional the Traffic division have also requested that is the Driver is Female then the fine should be reduced by 10%. You are hence tasked to create a program that receives input of the driver's full names, gender, speed driven and then print out the fine if necessary otherwise print out a praising message for the law abiding citizen.

Speed Range	Fine
Speed \geq 200	N\$ 15000
160 \leq Speed $<$ 200	N\$ 5500
140 \leq Speed $<$ 160	N\$ 3500
130 \leq Speed $<$ 140	N\$ 2800
Speed \geq 125	N\$ 2000

- A) Write a Pseudocode to solve the above problem [5]
- B) Create a flowchart for the above pseudocode. [8]
- C) With the help of both your Pseudocode and Flowchart, create a Java program that solves the problem as per the given problem description [12]

[END]