



**NAMIBIA 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: JULY 2019	PAPER: THEORY
DURATION: 2 Hours	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINERS	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
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**THIS MEMORANDUM PAPER CONSISTS OF 5 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. Examine the following cases, then for each case decide the correct data type to be used and create a valid declaration and assignment: Example: A very small number => byte number = 2;
 - A) The number of students at NUST : [2]
 - B) Your name: [2]
 - C) Whether a number is even or not: [2]
 - D) The amount of money in your bank account : [2]
 - E) The symbol you obtained in a certain subject : [2]

2. Indicate whether the following statements are TRUE or FALSE [10]
 - A) int, char and double are all examples of primitive data types in Java.
 - B) In Java, the identifiers student, Student, and sTudent are all same.
 - C) Every source file must be named the same as the class declared in the file
 - D) Once an Array is declared the size cannot be changed.
 - E) The == operator can be used to compare two String objects.
 - F) An array in the Java programming language has the ability to store only the same types of values.
 - G) For the expression (y >= z && a == b) to be true, both of (y >= z) and (a == b) must be true.
 - H) Consider the statement **max = (num1 > num2) ? num1: num2;** then the value of max is 25, if num1 is 18 and num2 is 25
 - I) The statement **if(!allowed)** will evaluate to false when allowed = true
 - J) The Java – (minus) operator is used for both substring and arithmetic subtraction

3. What is the difference between the following:
 - A) Compiler and Interpreter [3]
 - B) Low Level and High Level Programming languages [3]
 - C) Variables and Constants [3]

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


```

public class supp_Q4{
    public static void main(String[] args) {
        System.out.println(mystery(5));
    }
    static int mystery(int num){
        if(num <= 1)
            return 1;
        else{
            return mystery(num-1) + mystery(num-2);
        }
    }
}

```

5. A) Rewrite the following piece of code using a **while** loop. [5]

```
public static void display(String[] namibianPresidents,int Years[]){
    for (int i = 0; i < Years.length; i++) {
        System.out.printf("His excellency Dr %s came to office in %d %n",
            namibianPresidents[i],Years[i] );
    }
}
```

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

```
if(rating == 'E') //Excellent
    System.out.println("You must see this movie!");
else if(rating == 'A') //Average
    System.out.println("This movie is OK, but not great.");
else if(rating == 'B') //Bad
    System.out.println("Skip it!");
else
    System.out.println("Something is wrong.");
```

6. Create a method/function that takes in three arrays, one for student names, one for test marks and a last one for assignment mark. The method should then calculate the students qualifying mark (a student needs 50 or more to qualify) using the following weights: 40% of the test and 60% of the assignment, finally print out whether the person qualified or not. [10]

Use the below format for you print out:

Name	Test	Assignment	Final	Examination
Kingston	59	85	75	Allowed
John	52	45	48	Denied

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

```
4 public static void main(String[] args) {
5     int num1,num2,sum = 0; //variable declartion
6     Scanner kbdInput = new Scanner(System.in);
7
8     System.out.println("Input two whole numbers: ");
9     num1 = kbdInput.nextInt();
10    num2 = kbdInput.nextInt();
11
12    int start = (num1 < num2) ? num1:num2;
13    int end = (num1 > num2) ? num1:num2;
14
15    while(start <= end ){
16        if(start != end)
17            System.out.print(start+" + ");
18        else
19            System.out.print(start+" = ");
20        //calculating the sum
21        sum += start;
22        start++;
23    }
24    System.out.println(sum);
25    //Add code for average below
26
27 }
```

- A) What does line 8 do, and how is this called in Programming? [2]
- B) Explain what happens line 9? [2]
- C) What does line 12 do? [2]
- D) By making use of 9 and 5 as user input, briefly explain what is the purpose of this whole code snippet? [3]
- E) Line 25 provides a comment that requires you to add a new piece of code for calculating the average, provide this requested code.[hint: the quantity of the numbers is the difference between the num1 and num2, using Math.abs()] [3]

8. 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]

9. Given an employee's salary from user input, increment the salary according to the table below. After the increment all the employees earning above 10000 should pay an extra 5% solidarity tax on top of the normal 7.5% that every employee pays.

Salary Range	Percent of Increment
Salary \geq 12000	5%
8000 \leq Salary $<$ 12000	8%
5000 \leq Salary $<$ 8000	11.5%
2000 \leq Salary $<$ 5000	15%
Salary $<$ 2000	20%

The system should then print out the current employee's Salary and the percent of tax paid.

- 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 program as per the given problem description. [12]

[END]