NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF SOFTWARE ENGINEERING

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE, BACHELOR OF COMPUTER SCIENCE IN CYBER SECURITY AND BACHELOR OF INFORMATICS	
QUALIFICATION CODE: 07BCMS, 07BCCY, 07BAIT	**LEVEL:** 5
COURSE: PROGRAMMING 1	**COURSE CODE**: PRG510S
DATE: OCTOBER 2025	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 75

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	**MR MIKE KALE**
MODERATOR:	**MS NDINELAGO NASHANDI**

INSTRUCTIONS TO STUDENTS
1. Answer ALL the questions. 2. Read all the questions carefully before answering. 3. Number the answers clearly.

THIS QUESTION PAPER CONSISTS OF 10 PAGES
(Including this front page)

SECTION A: Multiple choices and True and false Questions [10 Marks]

*The section consists of **10** questions. Answer **ALL** the questions.*

1. Which of the following is a valid variable declaration in Java? **[1 Mark]**

   A. int 1number;
   B. float rate = 3.5f;
   C. char name = "John";
   D. boolean = true;

2. Which keyword is used to prevent modification of a variable in Java? **[1 Mark]**

   A. static
   B. const
   C. final
   D. protected

3. What is the return type of a method that returns no value? **[1 Mark]**

   A. null
   B. void
   C. int
   D. empty

4. How many times will the following loop execute? **[1 Mark]**

```
int i = 2;

while (i < 5) {
        i = i - 1;
        System.out.print(i);
        i++;
}
```

A. 4

B. 5

C. 6

D. Infinite

5. What will be the result of compiling the following code? **[1 Mark]**

```
int x;

System.out.println(x);
```

A. Prints 0

B. Compilation error

C. Runtime exception

D. Prints a random value

6. You can write an if statement in Java without using curly braces {} if it has only one statement in the block. **[1 Mark]**

A. True

B. False

7. A method in Java can return an array. **[1 Mark]**

   A. True
   B. False

8. A variable declared inside a for loop can be accessed outside the for loop body. **[1 Mark]**

   A. True
   B. False

9. In Java, you can declare multiple variables of different data types in a single declaration line. **[1 Mark]**

   A. True
   B. False

10. The switch statement in Java can be used with String values. **[1 Mark]**

    A. True
    B. False

SECTION B: BASIC QUESTIONS [11]

*This section consists of **5** questions. Answer **ALL** the questions.*

When is answering the questions in this section, it is not necessary to include the class and main method.

Question One [2 Marks]

Fill in the missing type to cast (type cast) the **value d** to an integer. Re-write the correct line 2 only.

1. double d = 10.75;
2. int i = _____ d;
3. System.out.println(i);

Question Two [2 Marks]

Declare two variables called first name and last name. Assign the value James to first name and assign the value Smith to last name. Create a new variable called full name that stores the full name by concatenating / combining the first name and last name.

Question Three [2 Marks]

Declare variable called x and assign it the value 10. Also declare a variable called y, and assign y a calculated square of x, then print the value of y to the console. **Do not use any java built-in/pre-defined methods.**

Question Four [3 Marks]

What is the purpose of the continue keyword in Java? How does it affect loop execution? Give an example that prints the numbers 1 to 5, excluding the number 2. You do not need to create a class and the main method.

Question Five [2 Marks]

Why is a base case necessary in recursion? What happens if it is missing?

SECTION C: DEBUGGING / CODE TRACING QUESTIONS [12]

*This section consists of **2** questions. Answer **ALL** the questions.*

Identify and correct any errors in the given Java code below. identify which lines (numbers on the left) have errors, describe the error and suggest how you will fix it. Ignore the absence of the main class or any surrounding structure. Just focus on correcting the code that is shown.

Question One [10 Marks]

```
1.  int number1 = 10;
2.  int number2 = 20.5;
3.  double result;
4.
5.  if (number1 > number2)
6.      System.out.println("Number1 is greater");
7.  else
8.      system.out.println("Number2 is greater");
9.
10. result = number1 / number2
11.
12. if (result > 0.5) {
13.      System.out.println("Result is greater than 0.5");
14. } else (result <= 0.5)
15.      System.out.println("Result is 0.5 or less");
16.
17. System.out.println("The value of total is: " + total);
18.
19. for(int i = 0; i =< 5; i++) {
20.       System.out.println("i = " + i)
21. }
22.
23. boolean flag = "true";
24. if(flag = false) {
25.     System.out.println("Flag is true");
26. } else
27.     System.out.println("Flag is false");
28. }
```

Question Two [2 Marks]

What will be the output of the following code? Ignore the absence of the main class or any surrounding structure. Just focus on snippet of code that is shown.

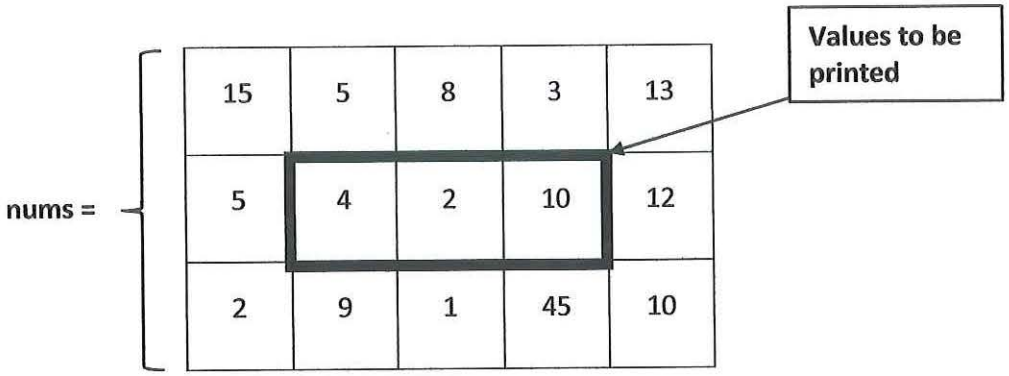
```
int[] data = {3, 1, 4, 1, 5};
int sum = 0;

for (int i = 0; i < 5; i++) {
    sum += data[data.length - 1 - i];
}

System.out.println(sum);
```

SECTION D: CODING [42]

*This section consists of **4** questions. Answer **ALL** the questions.*

Question One [4 Marks]

Given the two-dimensional array below called **nums**,



Write a Java code using **nested loops** to print the values **4, 2, 10** from the **second row** of the array as shown above. You should access only the relevant elements in the loop and display them to the console, in a single line, separated by spaces.

NOTE: Do not write the full Java program, write only the nested loop code that performs the printing.

Sample Run

4 2 10

Question Two [5 Marks]

You are tasked with developing a quiz system for children. The system should print the numbers from 1 to 150. For each number in this range, you need to check certain conditions. If the number is a multiple of 3, print "M3", if it is a multiple of 5, print "M5", if it is a multiple of both 3 and 5, print "M3-M5", and if none of these conditions are met, simply print the number itself. Write a complete Java program that accomplishes this behaviour. **Use loops for your solution.**

NOTE: YOU MUST NOT GET ANY INPUT FROM THE USER.

Question Three [10 Marks]

Write a Java program that prompts the user to enter 10 odd numbers. If the user enters a number that is not odd, the program should display the message "Only odd numbers must be entered.". The numbers that are not odd are not counted toward the 10 required odd numbers. Additionally, the program keeps track of how many invalid (non-odd) numbers the user attempted to enter. The program continues to prompt the user until exactly 10 valid odd numbers have been entered. The program should then display the total number of the numbers that are **not odd** (non-odd numbers) that the user attempted to enter. **Use loops for your solution.**

NOTE: DO NOT USE ARRAYS

Sample Run

```
Enter a number: 5
Enter a number: 3
Enter a number: 2
Only odd numbers must be entered.
Enter a number: 7
Enter a number: 9
Enter a number: 4
Only odd numbers must be entered.
Enter a number: 13
Enter a number: 1
Enter a number: 21
Enter a number: 15
Enter a number: 23
Enter a number: 11

Number of invalid (non-odd) inputs: 2
```

Question Four [23 Marks]

You are tasked with developing a simple system for a lecturer to enter the names and marks of **N students. N here is the number of students.**

Write a complete Java program that:

1. Prompts the user to enter the number of students.
2. For each student, asks for their name and mark.
3. Store the student names in an array called **names** and store their corresponding marks in an array called **marks.**

YOU MUST USE LOOPS FOR YOUR SOLUTION.

NOTE: The number of times the loop repeats is determined by the numbers of students.

Also create a method called **calculateAverage()** that accepts the **names array, marks array** and the **number of students** as parameters.

The **calculateAverage()** method should do the following:

1. Calculate the average mark of all students.
2. Print the average mark to the console.
3. Print the names and corresponding marks of students who scored above the average mark to the console.

YOU MUST USE LOOPS FOR YOUR SOLUTION.

NOTE: The logic to calculate and print the average mark and print the names and marks of the above average students must be implemented in a separate method called **calculateAverage().**

********** **END OF EXAM** **********