

PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

SEMESTER 1 EXAMINATION - 2021

CS115 - PROGRAMMING I

FIRST YEAR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

TIME ALLOWED: 3 HOURS

INFORMATION FOR CANDIDATES

1. Write your student number and name clearly on the front of the answer booklet.
2. You have 10 minutes to read this paper. You must not begin writing during this time.
3. **There are four (4) questions. You should attempt all the questions.**
4. All the answers must be written in the answer booklet. No other written materials will be accepted.
5. Do **not** use pencil or red pen to write your answers.
6. **MOBILE PHONES MUST BE SWITCHED OFF** for the entire duration of the examination. Students failing to do so will be penalised.

MARKING SCHEME

QUESTION	1	2	3	4	TOTAL
MARK	25	30	25	20	100

Question 1 [3 + 2 + 5 + 3 + 2 + 3 + 3 + 2 + 2 = 25 Marks]

- (a) Name the three (3) main types of programming languages.
- (b) Explain one of the three (3) main types of programming languages of your choice.
- (c) Name the five (5) generations of programming languages.
- (d) What is a source code?
- (e) What is an assembler?
- (f) What is an interpreter?
- (g) What are comments in a program source code?
- (h) What are bugs in a program code?
- (i) What is a data type?

Question 2 [2 + 6 + 2 + 2 + 4 + 2 + 2 + 2 + 6 + 2 = 30 Marks]

- (a) What is a program?
- (b) Name the six (6) programming processes in programming.
- (c) What is a variable?
- (d) State the difference between an assignment statement and a declaration statement.
- (e) List the four fundamental data types in Java and describe each data type.
- (f) State the main difference between a constant and a variable.
- (g) State the difference between a flowchart and pseudocode.
- (h) Express in your own words the difference between the while loop and the do-while loop.
- (i) After coding the program, you must prepare to test it on the computer. This step involves three phases, name the three phases and explain them.
- (j) State the difference between Conditional statements and Loop statements.

Question 3 [4 + 4 + 4 + 4 + 5 + 4 = 25 Marks]

(a) Refer to the program code below and write the exact output the program will produce.

```
public class Test {  
  
    public static void main(String args[]) {  
        int a = 10;  
        int b = 20;  
  
        System.out.println("a == b = " + (a == b) );  
        System.out.println("a != b = " + (a != b) );  
        System.out.println("a > b = " + (a > b) );  
        System.out.println("a < b = " + (a < b) );  
        System.out.println("b >= a = " + (b >= a) );  
        System.out.println("b <= a = " + (b <= a) );  
    }  
}
```

(b) Refer to the program code below and write the exact output the program will produce.

```
class forLoop {  
    public static void main(String args[])  
    {  
        int sum = 0;  
  
        for (int x = 1; x <= 5; x++) {  
            sum = sum + x;  
            System.out.println("Loop "+ x + " : " + " Sum = " + sum);  
        }  
    }  
}
```

(c) Refer to the program code below and write the exact output the program will produce.

```
class whileLoop {  
    public static void main(String args[])  
    {  
        int i = 1;  
  
        while (i < 6) {  
            System.out.println("While Loop " + i + " : Hello World");  
            i++;  
        }  
    }  
}
```

(d) Refer to the program code below and write the exact output the program will produce.

```
class dowhileloop {
    public static void main(String args[])
    {
        int x = 5, sum = 0;

        do {
            sum += x;
            x--;
        } while (x >= 10);

        System.out.println("Summation: " + sum);
    }
}
```

(e) Refer to the program code below and write the exact output the program will produce. Also fill in the two blank spaces in the program code.

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

        System.out.println("Assessment calculator ");

        int mark = _____;
        int score = _____;
        float percent = (score/mark)*100;

        if (percent >=50 && percent <65) {
            System.out.println("Passed with 'D'grade ");
        }

        else if (percent >=65 && percent <75) {
            System.out.println("Passed with 'C'grade ");
        }

        else if (percent >=75 && percent <85) {
            System.out.println("Passed with 'B'grade ");
        }

        else if (percent >=85 && percent <=100) {
            System.out.println("Passed with 'A'grade ");
        }
    }
}
```

```

        else {
            System.out.println("Failed this assessment");
        }
    }
}

```

(f) Refer to the program code below and write the exact output the program will produce.

```

import java.util.Scanner;

class GetInputData
{
    public static void main(String args[])
    {
        int num;
        float fnum;
        String str;

        Scanner in = new Scanner(System.in);

        //Get input String
        System.out.println("Enter a string: ");

        str = in.nextLine();

        System.out.println("Input String is: "+str);

        //Get input Integer
        System.out.println("Enter an integer: ");

        num = in.nextInt();

        System.out.println("Input Integer is: "+num);

        //Get input float number
        System.out.println("Enter a float number: ");

        fnum = in.nextFloat();

        System.out.println("Input Float number is: "+fnum);
    }
}

```

Question 4 [5 + 5 + 5 + 5 = 20 Marks]

(a) Write the code for a program named **testNumber**. Declare two variables of type integer with names **Num1** and **Num2** respectively. Assign any integer value to the variables.

Using these operators: $>$, $<$, construct else if statements in the program that will use the two whole numbers with each of the operator specified to test to see if the condition is true and print appropriate texts for every condition testing of the two numbers using the operators.

Sample Output

Output {if using $>$ is true}	Output {if using $<$ is true}	Output { else }
10 > 2	3 < 7	5 == 5

(b) Write the program code that will print the output shown below. Use the **for loop** statement in your program that will produce the output below.

```
1: Mary Jane
2: Mary Jane
3: Mary Jane
4: Mary Jane
5: Mary Jane
```

(c) Write the program code that will print the output shown below. Use the **while loop** statement in your program that will produce the output below.

```
While loop 1
While loop 2
While loop 3
While loop 4
While loop 5
```

(d) Write the program code that will print the output shown below. Use the **do-while loop** statement in your program that will produce the output below.

```
Do while: 1
Do while: 2
Do while: 3
Do while: 4
Do while: 5
```

END OF EXAMINATION