

# THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

## FIRST SEMESTER EXAMINATIONS - 2023

SECOND YEAR BACHELOR OF SCIENCE IN APPLIED PHYSICS AND  
ENGINEERING IN BIOMEDICAL ENGINEERING

### CS214 – INTRODUCTION TO PROGRAMMING (1)

TIME ALLOWED – 3 HOURS

#### INFORMATION FOR CANDIDATES:

1. Write your name and student number clearly on the front page of your answer booklet and fill in the attendance slip. Do it now.
2. You have 10 minutes to read this examination paper. You must not write in your answer booklet during this time.
3. There are three sections in this exam paper. Answer ALL the questions.
4. Notes, textbooks, mobile phones and other recording devices are not allowed in the examination room.
5. Write all answers in the answer booklet provided.
6. Start the answer for each question on a new page. Do not use **red ink** or **pencil**.

#### MARKING SCHEME

SECTION	1	2	3	TOTAL
MARK	9	45	22	76

**SECTION 1: MULTIPLE CHOICE****[ 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 9 marks ]**

1. What is the size of double variable in Java?

- A. 8 bit
- B. 16 bit
- C. 32 bit
- D. 64 bit

2. What is the default value of long variable in Java?

- A. 0
- B. 0.0
- C. 0L
- D. Not defined

3. Two things required to create an array;

- A. Data type and length
- B. Length and index
- C. Data type and index
- D. Non of the above

4. To change a value at a specific position in Java arrays, we consider the;

- A. Element
- B. Index
- C. Square bracket
- D. All of the above are correct

5. At a time, we can store lots of values in arrays.

- A. True
- B. False

6. What happens if a FileWriter constructor is given an illegal file name?

- A. The program bombs immediately
- B. The user disk is corrupted.
- C. The constructor returns a null value
- D. An IOException is thrown

7. What class should be used to buffer the characters sent to a FileWriter stream?

- A. BufferedFileWriter
- B. BufferedWriter
- C. Writer
- D. Buffer

8. The input/output package usually used with Java is:

- A. java.input
- B. java.io
- C. java.inout
- D. java.file

9. The path name of a file is given by; C:\MyFilesProgramsExample\someFile.txt

What is the absolute path name of the directory the file is located in?

- A. Examples
- B. exanplessomeFile.txt
- C. C:
- D. C:\MyFilesProgramsExample

**SECTION 2 : SHORT ANSWERS [ 8 + 4 + 2 + 2 + 3 + 3 + 3 + 3 + 2 + 2 + 2 + 4 + 4 + 3 = 45 marks ]**

1: Name the eight primitive data types in java.

2: Write the correct data type in front of the variables being declared.

- a. \_\_\_\_\_ myNum = 74;
- b. \_\_\_\_\_ myFloatNum = 5.99f
- c. \_\_\_\_\_ myLetter = ' D ' ;
- d. \_\_\_\_\_ myText = " hello " ;

- 3: Create a variable named *carName* and assign the value *Volvo* to it.
- 4: Create a variable named *maxSpeed* and assign the value *120* to it.
- 5: Write a piece of code that will print the product of two integer variables.
- 6: Write a piece of code that will print "Hallo world" if x is greater than y.
- 7: Create an array called *cars* with the following elements; Volvo, BMW, Ford, Toyota.
- 8: Write a piece of code to print the elements in the array in Q10.
- 9: List two disadvantages of an array.
- 10: List the two ways arrays are initialized in Java.
- 11: Explain what is an Algorithm?
- 12: List four characteristic of an algorithm?
- 13: The File class in java has many useful methods for manipulating information about files: below are four methods. Explain each one of their functionality.
  - a. `canRead()`
  - b. `createNewFile()`
  - c. `canWrite()`
  - d. `delete()`
- 14: This code computes  $A^B$ , What is the Big O runtime of this code?

```

static int power(int a, int b) {
    if (b < 0) return a;
    if (b == 0) return 1;
    int sum = a;
    for (int i = 0; i < b - 1; i++) {
        sum *= a;
    }
    return sum;
}

```

### QUESTION 3: CODING AND PROBLEM SOLVING [ 6 + 8 + 8 = 22 ]

#### 1: Factorial Problem

Factorial of n is the product of all positive descending integers.

Factorial of n is denoted by n!. For example:

$$4! = 4 * 3 * 2 * 1 = 24$$

$$5! = 5 * 4 * 3 * 2 * 1 = 120$$

- a. Write an algorithm to solve 10!
- b. Draw a flow chart to solve 10!
- c. Write a fragment of code to compute 10!

.....END OF EXAMINATION.....