

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

FOURTH YEAR EXAMINATION FOR THE
DEGREE BACHELOR OF SCIENCE (COMPUTER
SCIENCE)

COMP 404: OBJECT ORIENTED PROGRAMMING

STREAM: R

TIME: 2 HRS

DAY: MONDAY [8.30AM – 10.30AM]

DATE: 19/12/2022

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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INSTRUCTIONS: - Answer QUESTION ONE and any other TWO Questions.

QUESTION ONE

(30 MARKS)

- (a) Explain the output of the code below when compiled and executed. (4 marks)

```
#include <iostream>
using namespace std;

#define LENGTH 10
#define WIDTH 5
#define NEWLINE '\n'

int main() {
    int area;

    area = LENGTH * WIDTH;
    cout << area;
    cout << NEWLINE;
    return 0;
}
```

- (b) Define the following operators as used in C++ (6marks)

- (i) Arithmetic Operators
- (ii) Relational Operators
- (iii) Logical Operators
- (iv) Bitwise Operators
- (v) Assignment Operators
- (vi) Misc Operators

- (c) Explain the following loops in C++ (4 Marks)

- (i) for loop
- (ii) do...while loop
- (iii) nested loops
- (iv) while loops

- (d) What is an array? and how do you Declare an array in C++, (4 Marks)

- (e) Write a C++ programme where a variable has been declared at the top, but it can be defined inside the main function (6 Marks)

- (f) Discuss the following expressions in C++ (4 marks)

- (i) **lvalue**
- (ii) **rvalue**

QUESTION TWO

(a) Discuss and differentiate the syntax of the following two loops in C++

(4 Marks)

```
a). while(condition)
{
    statement(s);
}
```

```
b). #include <iostream>
using namespace std;
int main ()
{
    for( int a = 10; a < 20; a = a + 1 )
```

(b) Explain the output of the following C++ Syntax code

(4 Marks)

```
#include <iostream>
using namespace std;
int main ()
{
    // Local variable declaration:
    int a = 10;
    // do loop execution
    do
    {
        cout << "value of a: " << a << endl;
        a = a + 1;
    }while( a < 20 );
    return 0;
}
```

(c) Write The syntax for a **nested for loop** statement in C++

(4 Marks)

(d) Write a program that uses a nested for loop to find the prime numbers from 2 to 100:

(4 marks)

(e) Write a syntax of a break statement in C++

(4 Marks)

QUESTION THREE

- (a) Write C++ program to check whether the year entered is a leap year (4 marks)
- (b) Write a program that reads values for the length and width of a rectangle and returns the perimeter and area of the rectangle. (6 marks)
- (c) Write a C++ program to implement function calling (4 marks)
- (d) Write C++ program to handle exceptions using throw, catch and try (6 marks)

QUESTION FOUR

- (a) Explain the following various parts of C++ program? (4 Marks)
- (i) `<iostream>`
 - (ii) `// main`
 - (iii) `int main`
 - (iv) `return 0;`
- (b) Discuss any three reserved key words in C++. (3 Marks)
- (c) What's a trigraph sequence? (2 Marks)
- (d) C++ offers the programmer a rich assortment of built-in as well as user defined data types. Following table lists down seven basic C++ data types (4 Marks)
- (e) **Discuss** C++ programming language decision making statements. (6 marks)

QUESTION FIVE

- (a) Explain the output of the following C++ syntax code. (4 Marks)

```
#include <iostream>
using namespace std;
int main ()
{
    int a = 100;

    if( a < 20 )
    {
        cout << "a is less than 20;" << endl;
    }
    else
    {
        cout << "a is not less than 20;" << endl;
    }
}
```

```
}  
cout << "value of a is : " << a << endl;  
return 0;  
}
```

- (b) A **switch** statement allows a variable to be tested for equality against a list of values. Each value is called a case, and the variable being switched on is checked for each case. Write a **Syntax** for a **switch** statement in C++ (6 Marks)
- (c) Write a C++ syntax for a **nested if** statement (6 Marks)
- (d) Write a syntax for a **nested switch** statement (4 Marks)

