



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN DATA SCIENCE, BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY, BACHELOR OF SCIENCE IN COMPUTER SECURITY AND FORENSICS, BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE, BACHELOR OF TECHNOLOGY IN ELECTRICAL AND ELECTRONIC ENGINEERING, BACHELOR OF SCIENCE IN STATISTICS, BACHELOR OF SCIENCE IN MATHEMATICS, BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF EDUCATION SCIENCE AND BACHELOR OF EDUCATION ARTS

CIT 3153: OBJECT ORIENTED PROGRAMMING I

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Differentiate between the following terms
- Function overloading and function overriding (2 Marks)
 - Break statement and continue statement (2 Marks)
 - Call by value and call by reference (2 Marks)
- b) Write C++ statement to achieve each of the following purposes.
- Declare an integer variable m (2 Marks)
 - Declare and initialize an integer variable n with a value 8 (2 Marks)
 - Declare and reference variable r and assign it to m (2 Marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

- iv. Declare an integer pointer p (2 Marks)
- v. Assign the pointer p to point to the variable n (2 Marks)
- c) State four restrictions that apply to a destructor (4 Marks)
- d) Write a C++ code segment that declares a class called *vehicle*, with a private integer *chassisno* and public functions *drive* and *reverse* (4 Marks)
- e) Using an example, write the syntax for declaring a two-dimensional array. (2 Marks)
- f) Outline the benefits of Object-Oriented programming over procedural oriented programming (4 Marks)

QUESTION TWO (20 MARKS)

- a) The following code segment has several errors. Rewrite the segment using a while loop, and also without the errors. (5 Marks)

```

for (k=1;k<=rows)
    cout<<"Enter item " <<k;
    cin>>item
    cout<<item<<" Received \n";
}

```

- b) Write down the definition of a recursive function that receives an integer number and returns the factorial of the number. (5 Marks)
- c) Explain why and when we use the protected instead of the private access specifier. (2 Marks)
- d) The scope of an identifier is that part of the C++ program in which it is accessible Using relevant examples, discuss the four types of scope in C++. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Explain the importance of each of the following in a C++ program (3 Marks)
 - i. Inheritance
 - ii. Reference variables
 - iii. Scope resolution operator

- b) Using an example, explain general structure of an objected-oriented program in C++
(8 Marks)
- c) Consider a base class named *vehicle*, and a derived class named *motorcycle*. Write the syntax declaring the class motorcycle using private derivation mode.
(4 Marks)
- d) Using a C++ program example, explain the concept of member function overriding in a class definition.
(5 Marks)

QUESTION FOUR (20 MARKS)

- a) With the aid of a well labelled diagram differentiate between multiple inheritance and multi-level inheritance
(4 Marks)
- b) Consider some data stored in a 2-dimensional array of 4 columns and 10 rows. Write a C++ function that takes the array as the argument, and utilizes loops to display all elements of the array.
(6 Marks)
- c) Discuss the characteristics of a constructor function in object-oriented programming language.
(6 Marks)
- d) Write a C++ function that takes an integer (between 0 and 5) argument and uses a switch statement to output the number in words. If the number is beyond this range the function should output, "Number is too big!". The function should not have a return value.(4 Marks)

QUESTION FIVE (20 MARKS)

- a) Using a C++ program example, explain the concept of function overloading in a class definition.
(5 Marks)
- b) Using functions, write a C++ program that takes a variables radius and height as arguments and then calculates and returns the volume of a cylinder
(5 Marks)
- c) Access modifiers are normally used while defining classes in object-oriented programming. Using an example, discuss the access modifiers used in C++.
(6 Marks)
- d) Define the term inline function and state two conditions necessary for a function to be inline.
(4 Marks)

