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**University Examinations 2014/2015**

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN STATISTICS AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY AND BACHELOR OF SCIENCE IN COMPUTER SCIENCE

**CIT 3153: OBJECT ORIENTED PROGAMMING I**

 **DATE: OCTOBER 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Discuss the three access modifiers used in Object Oriented Programming. (3 Marks)
2. Discuss in detail citing examples the following concepts as used in Object Oriented Programming:
3. Polymorphism.
4. Encapsulation.
5. Inheritance. (6 Marks)
6. Write a program in C++ that accepts the price of a product in two supermarkets, the program then compares the two and outputs: a comment on which supermarket is more expensive depending on the outcome. (4 Marks)
7. Write the syntax and explain the parts that make up switch/select case statement. (5 Marks)
8. Write a program in C++ that accepts a user input number and checks if the number is even or odd; the program then outputs the appropriate message. (4 Marks)
9. Define the term array, discuss how array elements are accessed and write a statement that declares and initializes an array to store the marks of five students. (5 Marks)
10. Using examples differentiate between iteration and recursion as used in programming. (3 Marks)

**QUESTION TWO (20 MARKS)**

1. Write an object oriented program in C++ that awards students grades based on the following guidelines; A=70-100, B=60-69, C= 50-59, D=40-49, F=0-39. The program should request the user to input the mark attained by the student, and should return “an invalid input” error in case the user tries to input any value that is not in the range 0-100. (6 Marks)
2. Write the object oriented program in C++ that accepts and stores the CAT marks of then students in an array, the program then calculates and outputs the: lowest, highest, sum and average CAT marks. (8 Marks)
3. Discuss the phases of an object life cycle. (6 Marks)

**QUESTION THREE (20 MARKS)**

1. Write an object oriented program in C++ that allows a user to key in a number between 1 and 7; the program then outputs the respective day of the week using a SELECT CASE statement. (5 Marks)
2. Discuss the role of the following concepts in C++, giving a code snippet to support your explanation:
3. Preprocessor directive.
4. Scope resolution operator. (4 Marks)
5. Write a recursive program that accepts a user input number and calculates the Fibonacci of the number. (5 Marks)
6. Write a code to declare a function that calculates the simple interest earned by a loan and discuss the parts that make up the function. Interest = (principle\*rate\*time)/100. (4 Marks)
7. Discuss what you understand by function invoking and write a code snippet to invoke the function declared in 3(d) above. (2 Marks)

**QUESTION FOUR (20 MARKS)**

1. Write an object oriented program in C++ that allows a user to key in the quantity and the cost of each item a customer has bought; the program should then display the unit cost, the quantity and the total cost for each item bought. The program should have two functions one for input and the other for display. It should create a class called items and two objects namely item 1 and item 2. (6 Marks)
2. Discuss the role of a constructor and state any two properties of a constructor. (3 Marks)
3. Discuss in detail using diagrams any three forms of inheritance supported by C++. (6 Marks)
4. Write an object oriented program in C++ that outputs all the numbers between 100 and 300 (the two numbers included) that are divisible by 3 and the sum of those numbers. (5 Marks)

**QUESTION FIVE (20 MARKS)**

1. Briefly explain any five benefits of Object Oriented Programming. (5 Marks)
2. Write an object oriented program in C++ that requests the user for two input numbers a and b; the program should divide the two numbers and display the result if the denominator is not zero, if the denominator is zero it should throw an exception. (5 Marks)
3. Write a program in C++ that makes use of three classes namely:

 Student – stores student name and registration number.

 Mark-stores the test scores obtained in two subjects.

Result- inherits student details form students and test scores from mark and display the student details and the total of the test scores.

The program should create one object called graduate. (10 Marks)