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**University Examinations 2015/2016**

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

**CIT 3153: OBEJECT ORIENTED PROGRAMMING I**

**DATE: NOVEMBER 2015 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Define the term identifier and state any three rules to follow when naming an identifier. (4 Marks)
2. Using appropriate examples differentiate between the following as used in object oriented programming:
3. A class and an object
4. Recursion and iteration
5. A local and a global variable (9 Marks)
6. Define the term preprocessor directive, state any three directives and briefly mention the role of each. (4 Marks)
7. Write a program in C++ that accepts ten user input numbers, the program then calculates and displays the sum and the average of the numbers. (4 Marks)
8. Write a function definition, explain the parts that make up the definition and write a C++ statement to invoke the function. (6 Marks)
9. Discuss any THREE ways in which you can enhance the readability of a program. (3 Marks)

***SECTION B: ANSWER ANY TWO QUESTIONS {20 MARKS EACH}.***

**QUESTION TWO (20 MARKS)**

1. Discuss in detail citing examples any FOUR major object oriented concepts. (8 Marks)
2. Define the term array, discuss the concept of 2D arrays and cite two example scenarios that require the use of a 2D array. (5 Marks)
3. Write a program in C++ that declares three arrays: one to hold the names of five products, the second to hold the prices of each of the products and the third to hold the quantity of each of the products. The program should then accept user input and display the product name, its quantity, its price and its total value. (7 Marks)

**QUESTION THREE (20 MARKS)**

1. A salesman for an insurance company earns a basic salary, a house allowance and a commission of 5% for each policy sold. The basic salary is taxed at a rate of 30% and the commission is taxed at a rate of 8.5%. Design an algorithm and write a C++ program that will accept the basic salary, the house allowance and the total policies sold by a salesman, the solution should determine and output the gross pay, total tax deductions and the net pay. (9 Marks)
2. Discuss the phases of an object life cycle. (3 Marks)
3. The figure below shows the playground of a learning institution. Using functions write a C++ program that accepts the dimensions x, y and z, the program then calculates the total area covered by the playground take pi to be 3.142 (8 Marks)



**QUESTION FOUR (20 MARKS)**

1. Encapsulation is an important concept in object oriented programming; devise a working program that depicts the use of this concept, your program should prompt input from the user. Discuss how encapsulation has been used in your program. (8 marks)
2. Define the term exception and Explain the significance of exception handling in a program

 (4 marks)

1. Devise a program that requests a student’s age from the user. The program should accept positive age only. If the user enters a negative number, the program should throw an exception, and display a string or message. (8 marks)

**QUESTION FIVE (20 MARKS)**

1. Write a C++ program that accepts two user input numbers and the operation (+, - , / or \*) to carry out on the inputs, the program then uses the select case statement to perform the operation that the user chooses. (4 Marks)
2. Write a program in C++ that accepts the mass (in kilograms) and the height (in meters) of an individual then calculates the body mass index (BMI) based on the formula: BMI = mass/(height \* height), the program should then output the health risk associated with a BMI based on the following: underweight BMI < 18.5, Normal weight >= 18.5 and < 25, Overweight >= 25 and < 30, Obese >= 30. Your program should implement at least three functions, one for input, one for input, one for computation and the other for output. (7 Marks)
3. Define the term constructor and briefly discuss its role in programming (2 Marks)
4. Devise an object oriented program in C++ that uses a constructor. (7 Marks)