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University Examinations 2013/2014

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF IN BUSINESS INFORMATION TECHNOLOGY, INFORMATION TECHNOLOGY AND
COMPUTER TECHNOLOGY

BIT 2115/ICS 2201: OBJECT ORIENTED PROGRAMMING II

DATE: DECEMBER 2013

TIME: 2 HOURS

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

QUESTION ONE – 30 MARKS

- a. Differentiate between: (6 Marks)
 - i. A while and a do while loop
 - ii. Super-class and sub-class
 - iii. Conventional programming and event driven programming
- b. Discuss three access modifiers used in java programming. (3 Marks)
- c. Discuss in detail the following concepts as used in object oriented programming: (4 Marks)
 - i. Set ()
 - ii. Get ()
 - iii. Operator overloading
 - iv. Function overriding
- d. Write a program in java that accepts two user input numbers: number 1 and number 2, the program then compares the two numbers and outputs: number 1 equals number 2 or number 1 is less than number 2 or number 1 is greater than number 2 depending on the outcome. (4 Marks)
- e. Discuss in detail citing examples three main object oriented programming concepts. (6 Marks)
- f. Write the syntax and explain the parts that make up for a loop. (4 Marks)
- g. Write a program in java that accepts a user input number and checks if the number is even or odd, the program then outputs the appropriate message. (3 Marks)

QUESTION TWO – 20 MARKS

- a. Use an if-else statement to write an object oriented program in Java 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)
- b. Write an object oriented program in Java that implements a class Bank Account with the attributes: Ownername, AccountNumber and Balance and the methods; getBalance(), Deposit() and withdrawal(), the program should then implement a class OverdraftAccount with the attribute CreditLimit and inherits from the class BankAccount and override the method withdraw by adding the account balance to the CreditLimit i.e ($\text{DispensableAmount} = \text{Balance} + \text{CreditLimit}$)
(10 Marks)
- c. Differentiate between the following flow control statements citing example usage of each:
(4 Marks)
 - i. Exit
 - ii. Break

QUESTION THREE – 20 MARKS

- a. Java exception handling is managed by five keywords: state and discuss the role of each of the keywords.
(5 Marks)
- b. Define the term array and write a statement that declares and initializes an array to store the marks of five students.
(3 Marks)
- c. Write a recursive program that accepts a user input number and calculates the factorial of the number.
(4 Marks)
- d. Write a program in Java that accepts user input of the CAT marks of ten students and stores them in an array; the program then calculates and outputs the: lowest, highest, sum and average CAT marks.
(8 Marks)

QUESTION FOUR – 20 MARKS

- a. Differentiate between an applet and an application.
(2 Marks)
- b. Discuss in detail the life cycle methods of an applet.
(10 Marks)
- c. Write an object oriented program in java that defines a class circle with the attributes radius, area and circumference and the methods getArea and getCircumference which calculates and outputs the Area and the circumference respectively of an object CircleA, the program should make use of a constructor.
(8 Marks)

QUESTION FIVE – 20 MARKS

- a. Discuss the role of comments in Java; state and discuss the two kinds of comments. (5 Marks)
- b. Write a program in Java 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:
 $BMI = \text{mass} / (\text{height} * \text{height})$, the program should then output the health risk associated with a BMI based on the following: (5 Marks)
- Underweight $BMI < 18.5$
 - Normal weight ≥ 18.5 and < 25
 - Overweight ≥ 25 and < 30
 - Obese ≥ 30
- c. Discuss any five major benefits associated with the use of an object oriented programming language like java as opposed to procedural languages. (10 Marks)