MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

University Examinations 2018/2019

SECOND FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATIONS FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY,BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND FORENSICS, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF BUSINESS INFORMATION TECHNOLOGY,BACHELOR OF SCIENCE IN INFORMATION SCIENCE AND BACHELOR OF SCIENCE MATHEMATICS AND COMPUTER SCIENCE AND BACHELOR OF EDUCATION SCIENCE

CIT 3203: OBJECT ORIENTED PROGRAMMING II

DATE: SEPTEMBER 2019   **TIME: 2 HOURS**

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

a) Identify 4 features of an object oriented programming language.   (4 marks)

b) Differentiate between of the following operators.   (4 marks)

    (i)   && and ||

    (ii)   = = and =

c) Briefly explain the meaning of the following statements used in Java programming.   (4 marks)

    (i)   Static

    (ii)   Strings [ ] args

d) Briefly describe the purpose of any 2 math methods used in Java programming.   (2 marks)

e) Differentiate between run time and compiler errors and how they can be detected in Java programming.   (2 marks)

f) Briefly describe how encapsulation is applied in Java programming giving an example.   (2 marks)

g) Write a program to input 2 numbers and display the biggest and the smallest number among the three numbers entered.   (4 marks)

h) Write a Java code to create an object cube with length, height and width properties, a method to calculate the cube volume, create an instance for the object and use the

object instance to calculate the volume of a cube with length 20cm, height 15cm and width 10 cm then display the result. (4 marks)

i) Briefly explain the meaning of the following as used in Java programming. (4 marks)

      (i)   Byte-codes

      (ii)   Java virtual machine

QUESTION TWO (20 MARKS)

a) Differentiate between static and dynamic UML design giving an example in each case. (4 marks)

b) A company requires a program to enter employee name, hours worked and rate per hour of an employee then calculate basic pay=hours worked multiplied with rate per hour. Tax is calculated on basic pay as follows:

Basic Pay	Tax
Over 50000	20% of basic pay
Between 20000 and 50000	10% of basic pay
Below 20000	No tax

Write an object with employee name, hours worked and rate per hour properties, methods to calculate basic pay and tax then apply an object instance to store details of employees entered and perform the above calculations and display the result.

(6 marks)

c) Use an example in each case below to describe the purpose of the following Java math methods. (6 marks)

      (i)   Pow()

      (ii)   Min()

      (iii)   Sqrt()

d) Write a Java program to sort numbers 20, 12, 45, 9, 30 in ascending order. (4 marks)

QUESTION THREE (20 MARKS)

a) Use examples to illustrate the following: (6 marks)

      (i)   Constructor

      (ii)   Method

      (iii)   Exception

b) (i) Write a Java code to create class named student with student name, course and department properties. (4 marks)

(ii)Create another class called exam that inherits properties of student class created in 3b, i) above and has additional math, science and English marks properties and methods to calculate total and average marks. (4marks)

(iii)Write a program that uses exam instance to calculate student marks and display the result. (4marks)

c) Briefly explain the purpose of the following Java classes. (2 marks)
- (i) JFrame
- (ii) JLabel

QUESTION FOUR (20 MARKS)

a) Give three advantages of using objects in program development. (3 marks)
b) Write a Java program that input the radius of a sphere and calculate the volume. Where volume $= 4/3\Pi r^3$. (6 marks)
c) Briefly explain the following terms as used in Object Oriented Programming giving an example in each case. (4 marks)
- (i) Inheritance
- (ii) Polymorphism
d) Write a Java program to display numbers 2, 4, 6, 8, 10 and 12. (5 marks)

QUESTION FIVE (20 MARKS)

a) Given the following code snippet

```
For(int i=0;i<10;i++)
{
    System .out.printIn(i);
}
```

Rewrite the code using a while loop. (4 marks)
b) Write a program to produce the following addition table. (10 marks)

	1	2	3	4	5
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10

c) Write a program display the numbers 8, 7, 6, 5, 4, 3, 2, 1. (6 marks)