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KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 103: OBJECT ORIENTED PROGRAMMING I

DATE: Tuesday 21st August 2018   TIME: 11.00a.m-1.00p.m

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INSTRUCTIONS:

Answer question ONE and any other TWO questions

Question One ·

(a) Define object oriented programming.   (2 marks)
(b) Give three examples of primitive datatypes used in Java.   (3 marks)
(c) Write a simple Java program that uses a one dimension array to list the numbers 1 to 100.
                                                          (5 marks)

(d) Describe three steps involved in creation of an object from a class.   (6 marks)
(e) State the function of the following operators.   (4 marks)
  i. = assignment operator (used to initialise a variable) with values to object of run
  ii. += adds right operand to the left operand and assigns result to left operand
  iii. ! give of on operand in false (complements the operand) ! (x ≤ 10 && a ≥ 2
  iv. == (equals operator used to equate one variable to another). If the values of 2 operands are equal then the condition becomes true. A ==

(f) Write an object oriented Java program that reads in the values of a, b and c and computes and outputs the values of x1 and x2 in the equation.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Note: you must create and use an object in your program.   (10 marks)

Question Two

(a) Using suitable examples explain the meaning of the following words as used in object oriented programming.   (8 marks)
  i. Class

_____

ii. Method
iii. Object
iv. Constructor

b) Write a Java program that fills a two dimensional array with the sum of the row and column indexes and then displays the contents. Use 4 rows and 5 columns. (7 marks)

Question Three

a) A company buys goods from three different suppliers. Supplier A sells goods at 10% discount.
Supplier B sells at 15% discount. Supplier C sells at 8% discount. Write a java program that reads in the cost of goods bought from each company and computes the amount to be paid. (10 marks)

b) Using a do{}while() loop write a java program that outputs the numbers between 1..100 that are not divisible by both three and five.

(5 marks)

Question Four

(a) Explain the following paradigms of object oriented programming. (4 marks)
   (i) Inheritance
   (ii) Encapsulation

(b) Write an object oriented program that reads in marks from a student for 3 subjects(Eng, Kisw, Math), computes the total and average, and then displays the results.

(11 marks)

Question Five

(a) Using a do{...} while() loop write a java program that computes and displays the sum of all even numbers between 0 and 100 inclusive.

(8 marks)

(b) Define exceptions in Java, hence using a suitable diagram describe the exception hierarchy

(7 marks)

KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 103: OBJECT ORIENTED PROGRAMMING I

DATE: Monday 11th April 2016   TIME: 11.00a.m -1.00p.m

INSTRUCTIONS:

Answer questions ONE and any other TWO.

QUESTION ONE (30 MARKS)

(a) Describe the following: (4 marks)

    (i)   constructor

    (ii)   package

(b) Explain two GUI packages used in Java. *Swing Package, AWT*   (6 marks)

(c) Give three features of Java that make it good for mobile programming.   (3 marks)

(d) Identify three Java access modifiers.   (3 marks)

(e) Write a Java program that uses an array to read in ten random integers from the user, sorts them and outputs them in ascending order.   (10 marks)

(f) Given the statement:

    public static void main(String[]args)

    {...}

    Write the meaning of the following words.

    (i)   public

    (ii)   static

    (iii)   void

    (iv)   main

                                          (4 marks)

ENT IN ANY EXAMINATION IRREGULARITY SHALL LEAD TO DISCONTINUATION

QUESTION TWO(15 MARKS)

(a) Using a do{...}while() loop write a java program that displays the numbers between 1-100 inclusive that are divisible by both 2 and 3. (6 marks)

(b) Using a suitable diagram, describe the Java exception hierarchy. (5 marks)

(c) Differentiate between inheritance and interfaces. (4 marks)

QUESTION THREE (15 MARKS)

(a) Using suitable examples explain the meaning of the following words as used in object oriented programming. (8 marks)

    i. Method —

    ii. Object ⇁

    iii. super ⇒ is a key word that refers to superclass / parent objects

    iv. GUI component ⇒ push button, slider, labels, textfields, text areas

(b) Write a simple Java program that accepts an year as input and outputs whether that is normal year or a leap year. NOTE: leap year is divisible by 4. (7 marks)

QUESTION FOUR (15 MARKS)

(a) Write a method called **Stars** that outputs a line of stars to the screen. The user is asked to input the number of stars. For example, if they input 5 then the output would be: (8 marks)

(b) Using a 'for(){...}' loop, write a Java program that will print out all the multiples of 2 from 2 to 100 (i.e. 2 4 6...100) plus their sum. (7 marks)

QUESTION FIVE (15 MARKS)

(a) Explain three types of variables used in Java. Illustrate with examples. (9 marks)

(b) Describe the following Java primitive datatypes. (3 marks)

    i. Boolean

    ii. Char ASCII Characters

    iii. Float

(c) Identify three steps used in creation of objects in Java. (3 marks)

DATE: MONDAY 14TH APRIL 2014

TIME: 11.00A.M-1.00P.M

INSTRUCTIONS

Answer question ONE and any other TWO

Question One

(a) Define object oriented programming. (2 marks)

(b) Describe the following paradigms of object oriented programming. (9 marks)

   (i) Polymorphism

   (ii) Inheritance

   (iii) abstraction

(c) Write an object oriented program that accepts the length and width of a rectangle from the user, computes and outputs the area and perimeter of the rectangle. (10 marks)

(d) Identify three steps used when creating an object from a class. (3 marks)

(e) Describe the following primitive datatypes. (4 marks)

   (i)   byte

   (ii)   short

   (iii)   int

   (iv)   boolean

(f) Identify two access modifiers used in java. (2 marks)

Question Two

1) Explain the following types of variable used in Java. (6 marks)

   (i)   Local variables

   (ii)   Instance variables

   (iii)   Class variables

2) Explain the use of the following keywords in Java. (4 marks)

   (i)   Switch

   (ii)   Super

   (iii)   Void

   (iv)   new

3) write a simple Java program that accepts two numbers from the user and outputs the large number. (5 marks)

Question Three

(a) Explain the role of the following instance methods of the number class. (5 marks)

    (i)   abs()

    (ii)   ceil()

    (iii)   floor()

    (iv)   rint()

    (v)   exp()

(b) A certain school uses the following grading system to grade their students.

Mark 75-100 A

Mark 60-74 B

Mark 50-59 C

Mark<50 Fail

Write an appropriate object oriented Java program that can be used to read in a mark and award grade.

(10 marks)

Question four

(a) Define an array as used in programming. Illustrate how an array containing 10 integers can be declared. (4 marks)

(b) Study the code snippet below:

```
public class TestArray {

    public static void main(String[] args) {
        double[] myList = {1.9, 2.9, 3.4, 3.5};

        // Print all the array elements
        for (double element: myList) {
            System.out.println(element);
        }
    }
}
```

Indicate what would be output if the code is run. (3 marks)

(c) Write a Java program that creates a two dimensional array with 4 rows and 5 columns and fills it with the sum of column and row indexes. (8 marks)

Question five

(a) Using a diagram, describe the exception hierarchy of classes. (5 marks)

(b) State the function of the following operators. (4 marks)

    (i)   =

    (ii)   +=

    (iii)   !

    (iv)   ==

(c) Using a for loop, write a program that displays the numbers between 0 and 100 inclusive that are divisible by 3 and 5. (6 marks)

KENYATTA UNIVERSITY

UNIVERSITY EXAMINATION 2009/2010

INSTUTIONAL SCHOOL BASED PROGRAMME (IBP)

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(COMPUTER)

103
SCT 103: OBJECT ORIENTED PROGRAMMING

DATE: Wednesday 28th February 2010   **TIME:** 2.00p.m – 4.00p.m

INSTRUCTIONS: Attempt Question One and any other two questions

QUESTION 1

a) Explain the meaning of the following object-oriented programming concepts

(5 Marks)

    i.   Object

    ii.   Class Inheritance

    iii.   Polymorphism

    iv.   Abstraction

b) List down and explain the role of each keyword used to implement access restrictions to a class's members in C++. (6 Marks)

c) Explain the role of abstract classes in object-oriented programming. Using an appropriate code example illustrate how an abstract class can be utilized in a program. (6 Marks)

d) Explain the meaning of the term abstract data type (ADT). How are ADTs defined in programming languages. (3 Marks)

e) Using appropriate code snippets explain the concept of multiple inheritance. (6 Marks)

f) Briefly explain the inheritance process as regards the constructor of a derived class in relation to the constructor of the base class. (4 Marks)

QUESTION 2

a) Consider the two class specifications below (only the attributes have been shown). Using generalization create an inheritance hierarchy in C++ so that both of them inherit from a parent class called Publication.

Class Book: members are :- title, author, publisher and ISBN.

Class Magazine: members are: - title, editor and publisher. (6 Marks)

b) Explain the concept of operator overloading. (2 Marks)

c) Write a program that uses a class called MyClass that contains a single integer variable, a constructor that takes a parameter for the instance variable and a method show() that displays the value of the instance variable. The class overloads the addition (+) operator so that when objects of the class are added, the values of their respective variable are added. (12 Marks)

QUESTION ▯

a) Explain the role of virtual function in the C++ programming language.

(4 Marks)

b) Explain in brief the significance of using polymorphism in a program.

(4 Marks)

c) Write a program that defines a virtual base class named Shape that contains a single method called calcArea that can be used to calculate and return the area of an appropriate shape object. Create a derived class called Circle and another one called Rectangle and use these three classes to demonstrate the use of run-time polymorphism. (12 Marks)

QUESTION 4

a) Function arguments may be passed either by value or by reference. Explain the implications of using either method. (4 Marks)

b) Write a program that accepts a student's mark in a test and displays the appropriate grade. The program prompts the user to enter the student's mark from the keyboard then it displays the correct grade on the screen as per the following grading system. The program should use a function called getGrade

to determine the grade; the function receives the mark as parameter and returns the grade.

Mark	Grade
70 or more	A
60 or more	B
50 or more	C
40 or more	D
Below 40	F

(10 Marks)

c) Explain the importance of program documentation. (6 Marks)

QUESTION 5

a) Briefly explain how a compiler distinguishes overload methods at compile-time. (4 Marks)

b) Write a program that uses a class named Person with attributes of year of birth and height. Include methods/functions to set the two attributes. Include a constructor that takes two parameters for year of birth and height. Include a method that returns a person's age and one that returns the distance a person should jump if the jump twice their height.

The program should have a main method within your program to create one object of the class and use appropriate methods to display the age distance to jump. (10 Marks)

c) Explain the role of constructor and destructor functions. (6 Marks)