**UNITY UNIVERSITY**

**DEPARTMENT OF COMPUTER SCIENCE**

1. ***WRITE YOUR:-***

***NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

***IDNO\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

***DEPARTMENT\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

***TIME ALLOWED:-2:00 hour***

1. ***INSTRUCTION:***
2. **DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO**
3. **SWITCH OFF YOUR CELL PHONES**
4. **MAKE SURE THAT THE EXAM BOOKLET CONTAINS 4 PARTS**
5. **WRITE YOUR ANSWERS ON THE SPACES PROVIDED AFTER EACH QUESTION.**
6. ***FOR EVALUATION PURPOSE ONLY***

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| --- | --- | --- | --- | --- |
| ***Part One*** | ***Part Two*** | ***Part Three*** | ***Part Four*** | ***Total*** |
|  |  |  |  |  |

***Part One: Read the questions 1 to 6 carefully and give short and precise answer for each questions in the boxes provided under each questions (20 points).***

1. Explain how Java Compiler identifies which versions of Overloaded Method are called through the Objects of the Class by giving examples? (3 points)

|  |
| --- |
|  |

1. Write the difference between Class, Constructor, Method and Object used in Java Programming Language(4 points)

|  |  |  |  |
| --- | --- | --- | --- |
| ***Class*** | ***Constructor*** | ***Method*** | ***Object*** |
|  |  |  |  |

1. Write the ***General Syntax*** to define a class including all members of a class you define(3 points)

|  |
| --- |
| ***Syntax to define a Class*** |
|  |

1. Write the characteristics of the Object and the Syntax to follow to create Objects of a class and Syntax to call a method of a class(5 points)

|  |  |  |
| --- | --- | --- |
| ***Characteristics of Object*** | ***Syntax to Create Objects*** | ***Syntax to call a Method*** |
|  |  |  |

1. Explain clearly ***Garbage Collection*** in Java and write the Syntax used to define ***finalize()*** method(2 points)

|  |  |
| --- | --- |
| ***Garbage Collection*** | ***Syntax to define finalize () method*** |
|  |  |

1. Write the difference between argument passed call by value and call by reference by defining a method with ***examples***(3 points)

|  |  |
| --- | --- |
| ***Call By Value*** | ***Call By Reference*** |
|  |  |

***Part Two:- Read the java code that is described in each of the following questions (7- 9) carefully and identify the syntax errors you observed and write your answers inside the box provided under each questions (15 points)***

1. Observe the following simple java program and identify the syntax errors and write the errors inside the box provided (5 point)

Box {

double width;

double height;

// This is the constructor for Box class.

Box( double w, double h, double d) {

System.out.println("Constructing Box8");

width = 10;

height = 10;

}

**Syntax Errors**

// compute and return volume

double volume() {

width \* height \* depth;

}

}

class ConstructorExample{

public static void (String args[]) {

// declare, allocate, and initialize Box objects

Box mybox1 = new Box();

Box mybox2 = new Box();

// get volume of first box

vol = mybox1.volume();

System.out.println("Volume is " + vol);

// get volume of second box

vol = mybox2.volume();

System.out.println("Volume is " + vol);

}

}

1. Identify the syntax errors you observed for the following java program and write your answer inside the box provided to the right of the code (5 point).

//Define a class

class ThisKeyWord {

int m,n;

//Define Parameterized Constructor

ThisKeyWord(){

//Use this keyword to access the object on wich the method is invoked

//Use this keyword the variables defined with the same name not to hide instance variables

this.m ;

this.n;

**Syntax Errors**

}

//Define a method

public int SquareOne(){

return m\*n;

}

public int Square() {

return n \* n;

}

}

ThisKeyWordTest {

public static void main(String[] args) {

ThisKeyWord td1 = new ThisKeyWord (10,6);

td1.SquareOne();

td1.Square();

System.out.println("Result="+a+""+""+b);

}

}

1. Determine the syntax errors you observed for the following java code and write your answers( 5 points)

class Test {

int a, b;

Test(int i, int j) {

a = i;

b = j;

}

// return true if o is equal to the invoking object

boolean equals(Test o) {

if((a == a) && (b == b)) {

**Syntax Errors**

return true;

}

else {

false;

}

}

}

class PassOb {

public static void main(String args[]) {

Test ob1 = new Test();

Test ob2 = new Test(1);

Test ob3 = new Test(-1, -1);

System.out.println("ob1 == ob2: " + ob1.equals( ));

System.out.println("ob1 == ob3: " + ob1.equals());

}

}

***Part Three:-Read the java code that is found in each of the following questions (10-12) carefully and determine the output of the program you expect and write your answers inside the box provided under each questions (15 points)***

1. What is the output of the following java program and indicate the type of Object Oriented Principles implemented by this program? Write the output inside the box below (5 point).

class King {

void check() {

System.out.println("No parameters");

}

// =================================

void check(int a) {

System.out.println("a: " + a);

}

// =================================

void check(int a, int b) {

System.out.println("a and b: " + a + " " + b);

**Output**

}

// =================================

double check(double a) {

System.out.println("double a: " + a);

return a\*a;

}

}

classTestKing {

public static void main(String args[]) {

King ob = new King();

double result;

// ===================================

ob.check();

ob.check(10);

ob.check(10, 20);

result = ob.check(12.2);

System.out.println("Result of ob.test(12=.2): " + result);

}

}

1. What is the output of the following java program? Write the output inside the box below (4 point).

class StaticDemo {

**Output**

static int a = 112;

static int b = 77;

static void callme() {

System.out.println("The Value of a = " + a);

System.out.println("The Value of b = " + b);

}

}

class StaticByName {

public static void main(String args[]) {

StaticDemo.callme();

System.out.println("b = " + StaticDemo.b);

StaticDemo.callme();

System.out.println("a="+StaticDemo.a);

StaticDemo.callme();

System.out.println("b = " + StaticDemo.b);

}

}

***Part Four:-* Writing a program*. Write a java program based on the information given to you for the following three questions (12-17). Make your writing neat and provides comment if it is possible to make the program more readable. Use the attached blank paper for your answers (30 point)***

1. Suppose Sodere Resort Hotel wants to develop a program that is used to implement Bill of payments to the customers for the service rendered. The service type that the customer got from the hotel is different and the unit price for different services also not the same and quantity consumed also different. Assuming that the minimum service type that the customers they get is one and the maximum service type is three in number. Consider that, the hotel incurs 15% of Vat and 5% of service charge in addition to the unit cost of each service. Write java program to calculate total price of each services, total cost for all of the services provided and total payment expected from the customers after the vat and service charge is computed by defining the necessary ***class, parameterized constructors and methods and Objects of a class***(6 points).
2. A certain company plan to give a 40% of bonus to each of its employees at the end of every year for those who are working more than two years in the company. If an employee has been working ten or more years of the company, she/he to get an additional birr 100 in addition to bonus. Analyze and design the algorithm of this problem and write Java program to calculate (compute) a Bonus, Growth Payment, Tax, Pension, Total Deduction and Net Payment of an employee by defining the necessary class, methods, objects and the program is expected to perform all the required operation when the method is called(6 points).
3. Define a class, parameterized constructor, parameterized method and instance variables of a class to calculate Sum and Average of two numbers and area of a Circle(6 points)
4. Write Java Program to implement constructor of a class can call other constructor of the same class by using a key word ***this***. Suppose the program is used to calculate Volume of Box(3 points)
5. Write java program to implement garbage collection. Suppose the program is to remove a memory reference of one student claimed by another new incoming student(3 points)
6. Write Java Program to demonstrate Overloading Method by defining the method Area() and the method performs to calculate area of Triangle, rectangle and circle respectively when it is called from the main program through object of a class(4 points)