**KGISL INSTITUTE OF TECHNOLIGY**

***DEPARTMENT OF INFORMATION TECHNOLOGY***

CS8392 – OBJECT ORIENTED PROGRAMMING

**UNIT – 1**

INTRODUCTION TO OOP AND JAVA FUNDAMENTALS

**2 Marks**

***Questions and Answers***

1. **Define OOP.**

* It is a software design methodology.
* It is a software programming model that constructed based on objects.
* It aims to implement real world entities in programming

1. **What is Abstraction in OOP?**

In Object-oriented programming, abstraction is a process of hiding the implementation details from the user, only the functionality will be provided to the user. In other words, the user will have the information on what the object does instead of how it does it.

1. **Define Encapsulation in OOP?**

Encapsulation in Java is a mechanism of wrapping the data (variables) and code acting on the data (methods) together as a single unit. In encapsulation, the variables of a class will be hidden from other classes, and can be accessed only through the methods of their current class. Therefore, it is also known as data hiding.

1. **How does inheritance help to developers?**

Inheritance can be defined as the process where one class acquires the properties (methods and fields) of another. With the use of inheritance the information is made manageable in a hierarchical order. The class which inherits the properties of other is known as subclass (derived class, child class) and the class whose properties are inherited is known as super class (base class, parent class).

1. **What is polymorphism?**

Polymorphism is the ability of an object to take on many forms. The most common use of polymorphism in OOP occurs when a parent class reference is used to refer to a child class object.

1. **Define OOP Language.**

* Object-oriented programming language (OOPL) is a high-level programming language based on the object-oriented programming (OOP) model.
* Java is on of the general purpose object oriented programming language.
* Languages that follows oops principles other than java.
  + Simula, C++, Python … etc

1. **What is Object in OOP?**

* Objects are known as real world entities.
* It is an instance of a class.
* It has field and methods it is known as state and behavior of that object.
* Objects of the same class need not to be in same state.

1. **What is Class in OOP?**

* It is template definitions of methods and variable.
* Class is blue print of Object.
* Class should be instantiated before using.
* It is used to describe more than one object.
* A class is an extensible program-code-template for creating objects.

1. **Give a short note on Java Programming Language?**

Java is a high-level programming language originally developed by Sun Microsystems and released in 1995. Java runs on a variety of platforms, such as Windows, Mac OS, and the various versions of UNIX. It promises the developer to “Write Once Run Anywhere” their code. It supports the OOP’s concepts very well.

1. **What is the difference between JRE and JDK?**

* JRE is an acronym for Java Runtime Environment. It is also written as Java RTE. The Java Runtime Environment is a set of software tools which provides the environment to run a java application. It contains Java Virtual Machine and Libraries.
* JDK is an acronym for Java Development Kit. The Java Development Kit (JDK) is a software development environment which is used to develop java applications and applets. It contains JVM and Developer Tools and JRE.

1. **How to compile and run a java program? Give an example.**

***File Name: Main.java***

class Main{

public static void main(string[] args){

System.out.println(“hello world”);

}

}

Compilation: javac Main.java

Interpretation: java Main

1. **Write a java program that prints values of basic arithmetic operations done with two numbers?**

class Main{

public static void main(string[] args){

int a,b,c;

c=a+b;

System.out.println(“Add:”+c);

c=a-b;

System.out.println(“Sub:”+c);

c=a\*b;

System.out.println(“Mul:”+c);

c=a/b;

System.out.println(“Div:”+c);

}

}

1. How define a class in Java?

***Syntax:***

class ClassName{

data\_type variable;

…

return\_type methodName(argument list){

//Body of the method

}

…

}

**Example:**

Class Student{

int rollno;

String name;

Void setDetails(){

rollno=10;

name = “Raja”;

}

}

1. **Create a class for employee and use it?**

class Employee{

String name;

int empid;

double salary;

void setDetails(){

name="Raja";

rollno=23;

salary=23000.00;

}

void getDetails(){

System.out.println(name);

System.out.println(empid);

System.out.println(salary);

}

}

class Main{

public static void main(string[] args){

Employee e = new Employee();

e.getdetails();

e.setdetails();

}

}

1. **Give a short note on the constructor and its types.**

Constructor is a block of code that initializes the newly created object. A constructor resembles an instance method in java but it’s not a method as it doesn’t have a return type.

class Employee{

String name;

int empid;

double salary;

Employee(){

name="No Name";

empid =-1;

salary=-1;

}

void getDetails(){

System.out.println(name);

System.out.println(empid);

System.out.println(salary);

}

}

class Main{

public static void main(string[] args){

Employee e = new Employee();

e.getdetails();

e.setdetails();

}

}

1. **Give an example of a parameterized constructor.**

class Employee{

String name;

int empid;

double salary;

Employee(String name, int empid, int salary){

this.name = name;

this.empid = empid;

this.salary = salary;

}

void getDetails(){

System.out.println(name);

System.out.println(empid);

System.out.println(salary);

}

}

class Main{

public static void main(string[] args){

Employee e = new Employee(“Raja”,10,23000.0);

e.getdetails();

e.setdetails();

}

}

1. **What are the role of access specifiers in java and list its types?**

* Access specifiers provides an access to the members of java classes.
* There are 4 types of access specifiers available:
  + public
  + private
  + default
  + protected

1. **Define static members of the classes?**

The static keyword in java is used for memory management mainly. We can apply java static keyword with variables, methods, blocks and nested class. The static keyword belongs to the class than instance of the class.

The static can be:

* variable (also known as class variable)
* method (also known as class method)
* block
* nested class

1. **What is the purpose of comments in programs?**

The java comments are statements that are not executed by the compiler and interpreter. The comments can be used to provide information or explanation about the variable, method, class or any statement. It can also be used to hide program code for specific time.

Types of Java Comments

There are 3 types of comments in java.

* Single Line Comment
* Multi Line Comment
* Documentation Comment

1. **List the data types supported by java?**

Data types supported by java:

* Integer [byte, short, int, long]
* Decimal [float, double]
* Character [char]
* Boolean [bool]

1. **Define Variable in Java?**

* Variables are data holders in the programming language.
* A block of memory is named and accessed using variable name.
* The values of the variable may change during program execution.
* All variables are statically typed.
* You can’t use the variable which is not declared.

1. **List the operators supported by java.**

Operators supported by Java:

* Arithmetic [+,-,\*,/,%]
* Logical [&&,||]
* Relational [<,>,<=,>=]
* Shift[<<,>>]
* Bitwise[|,&,^]
* Ternary [?:]
* Assignment[=,+=,-=,\*=,/=,%=]

1. **What are all the control flow structures available in java?**

* Decision Makers
  + If-else.
  + If-else if-else.
* Looping
  + Deterministic Loops
    - For Loop
  + Non-Deterministic Loop
    - While
    - Do-while

1. **Write a program to print odd number up to 100?**

class Main{

public static void main(string[] args){

int i;

for(i=1;i<=100;i++){

if((i%2)!=0{

System.out.println(i);

}

}

}

}

1. **Define Arrays?**

* Normally, array is a collection of similar type of elements that have contiguous memory location.
* **Java array** is an object the contains elements of similar data type. It is a data structure where we store similar elements. We can store only fixed set of elements in a java array.
* Array in java is index based, first element of the array is stored at 0 index.
* Syntax:

data\_type[] variable = new data\_type[size];

int[] a = new int[10];