Hello sir,

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Q1. Write in brief about OOPS Concept in java with Examples. (In your own words).

Ans. OOPS-Object Oriented Programming

Object:- Object means a real world entity such as a book, table, mobile, TV, etc. OOP is a methodology to design a program using classes and objects.

Example:- A mobile is an object because it has states like brand, name, type, display etc. As well as behaviors like calling, messaging, etc.

Class:- Collection of objects is called class. It's a logical entity.

The main concept of OOPS is it include abstraction, encapsulation, inheritance and polymorphism. Java OOP concepts let us create working methods and variables, then re-use all or part of them without compromising security.

Java defines OOP concepts -

Abstraction:- Data abstraction is the process of hiding certain details and showing only essential information to the user.

Example:- We all know how to turn the TV on, but we don't need to know how it works in order to enjoy it.

=> In java abstraction means simple things like objects, classes and variables represent more complex underlying code and data. This is important because it lets you avoid repeating the same work multiple times.

Encapsulation:-The meaning of Encapsulation is to make sure that sensitive data is hidden form users.

A. Declare class variable/ attributes as private.

B. Provide public get and set methods to access and update the value of a private variable.

C. Class attributes can be made 'read-only' if we use the 'get' method, Or 'write-only' if we use 'set' method.

Inheritance:- It is possible to inherit attributes and methods from one class to another. It use the 'extends' keyword.

A. Subclass(child) - the class that inherits from another class.

B. Superclass(parent) - the class being inherited from.

```
class Mobile {
    protected String brand = "I phone";
    public void Mob(){
        System.out.println("Music, tune");
            }}
    class Phone extends Mobile {
        private String modelName = " 6-s";
        public static void main(String []args) {
            Phone myPhone = new Phone();
            myPhone.Mob();
        System.out.println(myPhone.brand + " " + myPhone.modelName);
        }}
```

Polymorphism:- It means Many forms when we have many classes that are related to each other by inheritance. It allow us to perform a single action in different ways.

```
class Vehicle {
    public void Bike() {
    System.out.pirntln("The bike is good for 2 people");
    }     }
class Car extends Vehicle {
        public void Bike(){
        System.out.println("The car is good for family")
    }}
class Bus extends Vehicle{
        public void Bike() {
```

```
        System.out.println("The Bus is good for school children");
}}
class Main{
        public static void main(String []args){
Vehicle myBike = new Vehicle();
Vehicle myCar = new Vehicle();
Vehicle myBus = new vehicle();
myBike.Bike();
myCar.Bike();
myBus.Bike();
}}
```

Multiple Choice Questions

Q1.Which of the following is used to make an Abstract class?

A. Making at least one member function as pure virtual function
B. Making at least one member function as virtual function.
C. Declaring as Abstract class using virtual keyword.
D. Declaring as Abstract class using static keyword

Ans. B. Making at least one member function as virtual function.

Q2. Which of the following is true about interfaces in java?

1) An interface can contain the following type of members….public, static, final field (i.e., constants) ….default and static methods with bodies
2) An instance of the interface can be created.
3) A class can implement multiple interfaces.
4) Many classes can implement the same interface.
    A. 1, 3 and 4
    B. 1, 2 and 4
    C. 2, 3 and 4
    D. 1, 2, 3 and 4

Ans. A. 1, 3 and 4

Q3. When does method overloading is determined?

A. At run time
B. At compile time
C. At coding time
D. At execution time

Ans. B. at compile time

Q4.What is the number of parameters that a default constructor requires?

A. 0
B. 1
C. 2
D. 3

Ans. A. 0

Q5. To access data members of a class, which of the following is used?

A. Dot Operator
B. Arrow Operator
C. A and B both as required
D. Direct call

Ans. A. Dot Operator.

Q6. Objects are the variables of the type___?

A. String
B. Boolean
C. Class
D. All Data types can be included

Ans. C. class

Q7. A non-member function cannot access which data of the class?

A. Private data
B. Public data
C. Protected data
D. All of the above

Ans.Private Data.

Q8. Predict the output of following Java Program.

```
Class Test {
        int i;
        }
class Main{
        public static void main(String []args) {
                Testt = new Test();
                System.out.println(t.i);
                }
        }
```

A. Garbage value
B. 0
C. Compiler error
D. Runtime Error

Output:Compiler error

Q9. Which of the following is/are true about packages in Java?

1) Every class is part of some package.
2) All classes in a file are part of the same package.
3) If no package is specified, the classes in the file go into a special unnamed package
4) If no package is specified, a new package is created with folder name of class and the class is put in this package.
   A. Only 1, 2 and 3
   B. Only 1, 2 and 4
   C. Only 4
   D. Only 1, 3 and 4

Ans. A.Only 1, 2 and 3.

Q10 to Q25 full explanation given below

Q10. Predict the output of Java Program?

```
class Base{
		public void show()
		{
			System.out.println("Base::show() called");
		}
	}
class Derived extends Base{
	public void show() {
		System.out.println("Derived::show() called");
		}
	}
class Main{
public static void main(String []args) {
		Base b = new Derived();
		b.show();
	}
}
```

Output: Derived::show() called

Q11. Output of the below Java program?

```
class Base{
public void show()              // here final public void in final delete then its
work
```

```
{
System.out.println("Base::show() called");
}
}
class Derived extends Base{
public void show() {
System.out.println("Derived::show() called");
}
}
class Main{
public static void main(String []args) {
Base b = new Derived();
b.show();
}
}
```

Output: `Derived::show() called`

Q12. Find output of the program.

```
class Base{
        public static void show() {
        System.out.println("Base::show() called");
        }
}
class Derived extends Base {
```

```
        public static void show() {
                System.out.println("Derived::show() called");
        }
}
        public class Hello {
                public static void main(String[] args) {
                Base b = new Derived();
                b.show();
        }
}
```

Output:- Base::show() called

Q13.What is the output following program?

```
class Derived{
                public void getDetails() {
                        System.out.printf("Derived class");
                }
}
                public class Hello extends Derived
        {
                public void getDetails()
        {
                System.out.printf("Test class");
                super.getDetails();
        }
                public static void main(String[] args) {
```

```
                Derived obj = new Hello();
                obj.getDetails();
        }
}
```

Output: Test class Derived class.

Q14. What is the output of the following program?

```
class Derived {
        public void getDetails(String temp)
        {
                System.out.println("Dervied class " + temp);
        }
}
        public class Hello extends Derived{
                public int getDetails(String temp) {
                System.out.println("Test class " + temp);
                return 0;
        }
        public static void main (String[] args) {
                Hello obj = new Hello();
                obj.getDetails("Name");
        }
}
```

Output:

Q15. What will be the output of the following java program?

```
class test
{
public static int y=0;
}
class HasStatic{
private static int x = 100;
public static void main(String[] args) {
HasStatic hs1 = new HasStatic();
hs1.x++;
HasStatic hs2 = new HasStatic();
hs2.x++;
hs1 = new HasStatic();
hs1.x++;
HasStatic.x++;
System.out.println("Adding to 100, x = " + x);
testt1 = new test();
t1.y++;
testt2 = new test();
t2.y++;
t1 = new test();
t1.y++;
System.out.print("Adding to 0, ");
System.out.println("y = " + t1.y + "" + t2.y + "" + test.y);
```

```
}
}
```

Output:Adding to 100, x = 104

Adding to 0, y = 333

Q16. Predict the output?

```
class San {
        public void m1 (int i, float f) {
        System.out.println("Int float method");
        }
public void m1 (float f, int i){
        System.out.println("float int method");
        }
public static void main(String[] args) {
        San s = new San();
        s.m1(20, 20);
}}
```

Output: float int method not work.

Q17.What is the output of the following program?

```
public class Test{
        public static void main(String []args) {
                int temp = (Integer) null;  find Error hereadd (Interger) or
                Integer data = null;
                System.out.println(temp + "" + data);
```

```
        }
    }
```

Output: //give any integer value, then executed.

```
    if int temp = 5; Integer data = null;
```

Output: 5 and null

Q18. Find Output?

```
    class Test{
    protected int x, y;
    }
        class Main{
        public static void main(String []args) {
            Test t = new Test();
            System.out.println(t.x + "" + t.y);
            }
    }
```

Output: 0 0

Q19.Find Output?

```
class Test1 {
    Test1 (int x){
        System.out.println("Constructor called "+ x);
        }
    }
```

```
class Test2 {
        Test1 t1 = new Test1(10);
        Test2 (int i){
t1 = new Test1(i);
}
public static void main(String []args) {
                Test2 t2 = new Test2(5);
        }
}
```

Output: Constructor called 10.

Constructor called 5.

Q20. What is the output of the following Java Program?

```
class Main {
        public static void main(String[] args) {
                int []x[]= {{1,2},{3,4,5},{6,7,8,9}};
                int [][]y = x;
                System.out.println(y[2][1]);
        }
}
```

Output:- 7

Q21. Find the output of java program?

```
class A {
int i;
public void display()
{
```

```
        System.out.println(i);
        }
}
class B extends A{
        int j;
        public void display(){
        System.out.println(j);
}}
class Dynamic_dispatch{
public static void main(String [] args) {
        B obj2 = new B();
        obj2.i = 1;
        obj2.j = 2;
        A r;
        r = obj2;
        r.display();
}}
```

Output: 2

Q22. Find output following java code?

```
class A {
                int i;
                public void display()
        {
        System.out.println(i);
        }
```

```
}
class B extends A{
	int j;
	public void display()
		{
		System.out.println(j);
	}}
class method_overrding
	{
public static void main(String[] args) {
	B obj = new B();
	obj.i = 1;
	obj.j = 2;
	obj.display();
	}}
```

Output: 2

Q23. What will be the output of the following Java code?

```
	class A{
		public int i;
		protected int j;
		}
		class B extends A {
		int j;
		void display() {
		super.j = 3;
```

```
            System.out.println(i + ", " + j);
            }
        }
        class Output{
        public void main(String[] args) {
        B obj = new B();
            obj.i=1;
            obj.j=2;
            obj.display();
            }
        }
```

Output:- 1, 2

Q24. What will be the output of the following Java program?

```
        class A{
            public int i;
            public int j;
        A(){
            i=1;
            j=2;
        } }
class B extends A {
        int a;
            B(){
            super();
            }  }
```

```
class super_use{
public static void main(String []args) {
	B obj = new B();
	System.out.println(obj.i + " , " + obj.j);
		}
	}
```

Output: 1 , 2

Q.25. Find the output of the following program.

```
	class Test {
		inta = 1;
		intb = 2;
		Test func (Test obj) {
			Test obj3 = new Test();
				obj3 = obj;
				obj3.a = obj.a++ + ++ obj.b;
				obj.b = obj.b;
				return obj3;
				}
	public static void main(String[] args) {
		Test obj1 = new Test();
		Test obj2 = obj1.func(obj1);
		System.out.println("obj1.a =" + obj1.a + " obj1.b = " + obj1.b);
		System.out.println("obj2.a=" + obj2.a + " obj1.b = "+ obj2.b);
		}  }
```

Output:- obj1.a =4 obj1.b = 3

```
  obj2.a=4 obj1.b = 3
```