FULL STACK DEVELOPMENT – WORKSHEET 4

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

A1. (a) OOPS in java stands for Object Oriented Programming system.

(b) OOPS concept works on the principle of Abstraction, Encapsulation, Inheritance and Polymorphism.

(c) Basic concept of OOPS is to create an Object, Manipulate and Reuse them in the program to get results.

OOPS concept in Java with Examples:

(a) Class: It is the basic concept of OOPS.
Example: If you have class called Bike, it could have Objects like Yamaha, Hero Honda, TVS etc.

(b) Object: It is defined as instance of class. It contains both data and function which operates on data.
Example: Pen, Car, Bike etc.

Q2 .Write simple programs (wherever applicable) for every example given in Answer 2.

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

A1. **A. Making at least one member function as pure 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 fields (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

A2. **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

A3**. B. At compile time that is why it is also called compile time polymorphism.**

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

A. 0

B. 1

C. 2

D. 3

A4. **A. 0 A default constructor does not requires any parameters.**

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

A5. **A. Dot Operator is used to access data members of a class.**

Q6.Objects are the variables of the type ____?

A. String

B. Boolean

C. Class

D. All data types can be included

A6. **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

A7. **A. Private data**

Q8. Predict the output of following Java program

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

A. garbage value

B. 0

C. compiler error

D. runtime Error

A8. **B. 0**

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

A9. **A. Only 1, 2 and 3**

For Q10 to Q25 find output with explanation.

Q10.Predict the Output of following 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");
}
}
public class Main {
public static void main(String[] args) {
Base b = new Derived();;
b.show();
}
}
```

A10. When we run the program it has a class named Main which has another class named Base and has a Derived class which extends Base class it shows **Derived::show() called.**

Q11. What is the output of the below Java program?

```
class Base {
final 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();
}
}
```

A11. Output of the program will be java error **“ java.lang.IncompatibleClassChangeError**”. This is because of the final keyword as it cannot be extended further to the another classes.

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

A12. The output of the program is **“Base::show() called”,** this is because the derived class extends the base class.

Q13.What is the output of the following program?

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

A13. The program output will be “**Test class Derived class**”.

Q14. What is the output of the following program?

```
class Derived
{
public void getDetails(String temp)
{
System.out.println("Derived class " + temp);
}
}
```

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

A14**.** The output of the program will be **error “The return type is incompatible with Derived.getDetails(String)”.**

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);
test t1 = new test();
t1.y++;
test t2 = 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);
}
}
```

A15. The output of the program shows **“Error: Main method not found in class test”.**

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);
}
}
```

A16. The output of the program shows “**error: missing method body, or declare abstract public void m1(float f,int i)**;”.

Q17.What is the output of the following program?

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

A17. The output of the program shows “**error: incompatible types: <null> cannot be converted to int int temp = 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);
}
}
```

A18. The system output shows “**Error: Main method not found in class Test, please define the main method as: public static void main(String[] args)”.**

Q19.Find output

```
// filename: Test2.java
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);
}
}
```

A19. The program output shows **" Error: Main method not found in class Test1, please define the main method as: public static void main(String[] args)"** .

Q20.What will be 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]);
}
}
```

A20. The output of the java program will be "**7**".

Q21.What will be the output of the following 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();
}
}
```

A21 The program output shows **“ Error: Main method not found in class Test1, please define the main method as: public static void main(String[] args)**″ .

Q22. What will be the output of the following Java code?

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

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

A22. The program output will be “**Error: Main method not found in class A, please define the main method as: public static void main(String[] args)”.**

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 static void main(String args[])
{
B obj = new B();
obj.i=1;
obj.j=2;
obj.display();
}
}
```

A23. The output of the java program "**Error: Main method not found in class A, please define the main method as: public static void main(String[] args)".**

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

```
class A
{
public int i;
public int j;
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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)
}
}
```

A24. The program output shows “**error: ';' expected System.out.println(obj.i + " " + obj.j)”**

Q 25. Find the output of the following program.

```
class Test
{
int a = 1;
int b = 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);

}

}
```

A25. The output of the java program shows “**obj1.a = 4 obj1.b = 3 obj2.a = 4 obj1.b = 3”.**