**Question Bank**

**Object Oriented Programming in Java**

1. Explain Java Buzz words in brief.
2. Explain Bytecode and Java Virtual Machine.
3. What are Wrapper Classes? Explain with example
4. What is array? Write a program to create an array of 10 integers. Display the average of these elements.
5. Explain interface in JAVA. How do interfaces support polymorphism?
6. Describe **abstract** class called **Shape** which has three subclasses say **Triangle, Rectangle, Circle**. Define one method **area()** in the abstract class and override this **area()** in these three subclasses to calculate for specific object i.e. **area()** of Triangle subclass should calculate area of triangle etc. Same for **Rectangle** and **Circle**
7. Write a program that illustrates interface inheritance. Interface **P** is extended by **P1** and **P2**. Interface **P12** inherits from both **P1** and **P2**. Each interface declares one constant and one method. class **Q** implements **P12**. Instantiate **Q** and invoke each of its methods. Each method displays one of the constants
8. Differentiate String class and StringBuffer class with explanation of its methods.
9. Differentiate Method Overloading and Method Overriding with example.
10. Explain features of **JAVA**.
11. Differentiate between Constructor and method
12. Explain Dynamic Method Dispatch with example
13. Explain this, super, final keywords
14. Design a class named Fan to represent a fan. The class contains: - Three constants named SLOW, MEDIUM and FAST with values 1, 2 and 3 to denote the fan speed. - An int data field named speed that specifies the speed of the fan (default SLOW). - A boolean data field named f_on that specifies whether the fan is on (default false). - A double data field named radius that specifies the radius of the fan (default 4). - A data field named color that specifies the color of the fan (default blue). - A no-arg constructor that creates a default fan. - A parameterized constructor initializes the fan objects to given values. - A method named display() will display description for the fan. If the fan is on, the display() method displays speed, color and radius. If the fan is not on, the method returns fan color and radius along with the message “fan is off”.
Write a test program that creates two Fan objects. One with default values and the other with medium speed, radius 6, color brown, and turned on status true. Display the descriptions for two created Fan objects.

15. Define the Rectangle class that contains: Two double fields x and y that specify the center of the rectangle, the data field width and height, A no-arg constructor that creates the default rectangle with (0,0) for (x,y) and 1 for both width and height. A parameterized constructor creates a rectangle with the specified x,y, width and height. A method getArea() that returns the area of the rectangle. A method getPerimeter() that returns the perimeter of the rectangle. A method contains(double x, double y) that returns true if the specified point (x,y) is inside this rectangle. Write a test program that creates two rectangle objects. One with default values and other with user specified values. Test all the methods of the class for both the objects.

16. Explain Java garbage collection mechanism.

17. State whether the following statements are true or false:
   (i) The elements in an array must be of primitive data types.
   (ii) When invoking a constructor from a subclass, its super class’s no-arg constructor is always invoked.
   (iii) A method can change the length of an array passed as a parameter.
   (iv) An interface can extend an abstract class.
   (v) An abstract class contains constructors.

18. State whether any error exists in the following code. If so, correct the error and give output.

class Test {
public static void main(String args[]) {
    A a = new A();
a.print();
}
}
class A {
    String s;
    A(String s) {
        this.s=s;
    }
    public void print() {

19. Give output of the following program:

```java
public class Test {
    public static void main(String args[]) {
        Count myCount = new Count();
        int times=0;
        for(int i=0;i<100;i++)
            increment(myCount,times);
        System.out.println("count is "+myCount.count);
        System.out.println("times is "+times);
    }
    public static void increment(Count c,int times) {
        c.count++;
        times++;
    }
}

class Count {
    public int count;
    Count(int c){ count=c; }
    Count(){ count=1; }
} //ANSWER: MYCOUNT : 101 TIMES:0
```

20. Answer the following questions:

   (i) What is an inner class?
   (ii) Ragged/Jagged Array

21. The abstract Vegetable class has three subclasses named Potato, Brinjal and Tomato. Write an application that demonstrates how to establish this class hierarchy. Declare one instance variable of type String that indicates the color of a vegetable. Create and display instances of these objects. Override the toString() method of Object to return a string with the name of the vegetable and its color.

   The Transport interface declares a deliver() method. The abstract class Animal is the superclass of the Tiger, Camel, Deer and Donkey classes. The Transport interface is implemented by the Camel and Donkey classes. Write a test program that initialize an
array of four Animal objects. If the object implements the Transport interface, the deliver() method is invoked.

22. Declare a class called employee having employee_id and employee_name as members. Extend class employee to have a subclass called salary having designation and monthly_salary as members. Define following:
   - Required constructors
   - A method to find and display all details of employees drawing salary more than Rs. 20000/-.
   - Method main for creating an array for storing these details given as command line arguments and showing usage of above methods.

23. Explain short circuited operators and shift operators.

24. Explain inner class and working of concatenation operator + by giving examples.

25. Differentiate between constructor and method of class. Define method overloading and its purpose. Write a program to demonstrate the constructor overloading.

26. Define polymorphism with its need. Define and explain static and dynamic binding using program.

27. Explain single level and multiple inheritances in java. Write a program to demonstrate combination of both types of inheritance as shown in figure 1.i.e.hybrid inheritance

28. Write a program to demonstrate the multipath inheritance for the classes having relations as shown in figure 2.
29. Define and write a program to differentiate between pass by value and pass by reference.

30. Differentiate between abstract class and interface specifying matrices of differences. Write a program to define abstract class, with two methods addition() and subtraction(). addition() is abstract method. Implement the abstract method and call that method using a program(s).

31. What is Exception? Explain any three built-in exceptions

32. What is the difference between Checked and Unchecked exception

33. How to handle an Exception? Explain with an example

34. What is the difference between throw and throws?

35. Create user defined exception which is raised when number of command line arguments less than 3

36. Write an application that generates custom exception if any value from its command line arguments is negative.

37. What is Applet? Explain its lifecycle in detail

38. Explain Delegate Event Model in detail

39. Enlist and explain different events and listeners

40. Write a Java program to display the message on the applet wherever mouse click occurs

41. Write a Java program to implement Calculator using ComboBox as operator selector

42. What are different Layouts? Explain with example.

43. Write a program to display a Application Form using GUI controls.

44. Differentiate Applet and Application.

45. Write an applet that contains three buttons OK, CANCEL and HELP and one textfield. if OK is pressed shown on the status bar-“OK is pressed” and the textfield should turn red. When CANCEL is pressed -shown on the status bar-“CANCEL is pressed “and text field should turn green. When HELP is pressed shown on the status bar-“HELP is pressed” and the text field should turn yellow.

46. Explain Event Handling in java and describe methods of mouse event and key event.

47. Name three types of layout managers and briefly explain their operations.

48. What is an event source? What are the three responsibilities of event sources?
49. Write an applet that tracks the position of the mouse when it is dragged or moved. At the current mouse position, it displays message (x, y) showing current position of the mouse. The message should disappear as soon as the user releases the mouse.

50. Create a class for computing xy by doing repetitive multiplication. x and y are of type integer and are to be given as command line arguments. Raise and handle exception(s) for invalid values of x and y. Also define method main. Use finally statement.