Q1: Answer

```
package com.prathamesh.jan31;
abstract class Vehical{
    public abstract void engine();
}
class Car extends Vehical{
    @Override
    public void engine() {
        System.out.println("Car has good engine");
    }
}
class Truck extends Vehical{
    @Override
    public void engine() {
        System.out.println("Truck has bad engine");
    }
}
public class Q1 {
    public static void main(String[] args) {
    Car c1= new Car();
    c1.engine();
    Truck t1= new Truck();
    t1.engine();
    }
}
```

Output:

```
Car has good engine
Truck has bad engine
```

Q2:Ans

```
package com.prathamesh.jan31;

abstract class Instrument {
    public void play() {

    }
}

class Piano extends Instrument {
    @Override
    public void play() {
        System.out.println("Piano is playing  tan tan tan tan ");
    }
```

```
}

class Flute extends Instrument {
    @Override
    public void play() {
        System.out.println("Flute is playing  toot toot toot toot");
    }
}

class Guitar extends Instrument {
    @Override
    public void play() {
        System.out.println("Guitar is playing  tin  tin  tin ");
    }
}

public class Q2 {
    public static void main(String[] args) {
        Instrument A_test[] = new Instrument[10];
        for (int i = 0; i < 10; i++) {
            switch (i % 3) {
                case 0: {
                    A_test[i] = new Piano();
                    break;
                }
                case 1: {
                    A_test[i] = new Flute();
                    break;
                }
                case 2: {
                    A_test[i] = new Guitar();
                    break;
                }
            }
        }
        for (int i = 0; i < 10; i++) {
            System.out.println("---------------------------------");
            System.out.println(" object # " + (i + 1));
            A_test[i].play();
            if (A_test[i] instanceof Piano) {
                System.out.println("Piano");
            }
            if (A_test[i] instanceof Flute) {
                System.out.println("Flute");
```

```
            }
            if (A_test[i] instanceof Guitar) {
                System.out.println("Guitar");
            }
        }
    }
}
```

Output:

```
-------------------------------------
 object # 1
Piano is playing  tan tan tan tan
Piano
-------------------------------------
 object # 2
Flute is playing  toot toot toot toot
Flute
-------------------------------------
 object # 3
Guitar is playing  tin  tin  tin
Guitar
-------------------------------------
 object # 4
Piano is playing  tan tan tan tan
Piano
-------------------------------------
 object # 5
Flute is playing  toot toot toot toot
Flute
-------------------------------------
 object # 6
Guitar is playing  tin  tin  tin
Guitar
-------------------------------------
 object # 7
Piano is playing  tan tan tan tan
Piano
-------------------------------------
 object # 8
Flute is playing  toot toot toot toot
Flute
-------------------------------------
 object # 9
Guitar is playing  tin  tin  tin
Guitar
-------------------------------------
 object # 10
Piano is playing  tan tan tan tan Piano
```

Q3:Ans

```
package com.prathamesh.jan31;

class Medicine {
    String date;
    int P;

    public void getDetails(int P, String date) {
        System.out.println("Price");
        System.out.println("Expiry date");
    }

    public void displayLabel() {
        System.out.println("Company : Cadila Health");
        System.out.println("Address : Ahemdabad");
    }
}

class Tablet extends Medicine {
    public void displayLabel() {
        System.out.print("Tablet: ");
        System.out.println("store in a cool dry place");
    }
}

class Syrup extends Medicine {
    public void displayLabel() {
        System.out.print("Syrup: ");
        System.out.println("Consumption as directed by the physician");
    }
}

class Ointment extends Medicine {
    public void displayLabel() {
        System.out.print("Ointment: ");
        System.out.println("for external use only");
    }
}

class TestMedicine {
    public static void main(String[] args) {
        Medicine m_t[] = new Medicine[10];
        double i = Math.random() * 4;
        int j = (int) i;
```

```
        System.out.println(j);
        switch (j) {
            case 1:
                m_t[0] = new Medicine();
                m_t[1] = new Tablet();
                m_t[0].displayLabel();
                m_t[1].displayLabel();
                break;
            case 2:
                m_t[2] = new Medicine();
                m_t[3] = new Syrup();
                m_t[2].displayLabel();
                m_t[3].displayLabel();
                break;
            case 3:
                m_t[4] = new Medicine();
                m_t[5] = new Ointment();
                m_t[4].displayLabel();
                m_t[5].displayLabel();
                break;
            default:
                System.out.println("Invalid Choice");
        }
    }
}
```

Output:

```
2
Company : Cadila Health
Address : Ahemdabad
Syrup: Consumption as directed by the physician
```

Q4:Ans

```
package com.prathamesh.jan31;

abstract class Shape {
    public abstract void area();
}

class Circle extends Shape {
    @Override
    public void area() {
```

```
        float r = 3.5f;
        System.out.println("Area of Circle:: " + Math.PI * r * r);
    }
}

class Square extends Shape {
    @Override
    public void area() {
        float side = 4.0f;
        System.out.println("Area of Square:: " + 4 * side);
    }
}

class Cylinder extends Circle {
    @Override
    public void area() {
        float height = 3.0f;
        float r = 4.0f;
        double area = 2 * Math.PI * r * height + 2 * Math.PI * r;
        System.out.println("Area of Cylinder::" + area);
    }
}

class Rectangle extends Square {
    @Override
    public void area() {
        float length = 4.8f;
        float bradth = 3.2f;
        double area = length * bradth;
        System.out.println("Area of Rectangle::" + area);

    }
}

public class Q4 {
    public static void main(String[] args) {
        Shape s_test[] = new Shape[4];
        for (int i = 0; i < 1; i++) {

            s_test[i] = new Square();
            s_test[i].area();
            System.out.println("****************************************");
            s_test[i] = new Circle();
            s_test[i].area();
```

```
            System.out.println("****************************************");
            s_test[i] = new Cylinder();
            s_test[i].area();
            System.out.println("****************************************");
            s_test[i] = new Rectangle();
            s_test[i].area();
        }

    }
}
```

Output:

```
Area of Square:: 16.0
****************************************
Area of Circle:: 38.48451000647496
****************************************
Area of Cylinder::100.53096491487338
****************************************
Area of Rectangle::15.360000610351562
```