

**Question 01**

The Volume of a Cylinder can be found with the following formula:

Volume = PI \* Radius\*Radius\*Height where PI=3.14159

It is required to map the above class diagram to Java code.

Note: Container is an abstract class.

Height & Radius are private variables

All the methods are public

(i) Write down the Java definition of class container

**Answers**

public abstract class Container { private double height; private double radius;

public Container(double height, double radius) {

this.height = height; this.radius = radius;

}

public double getHeight() {

return height;

}

public void setHeight(double height) {

this.height = height;

}

public double getRadius() {

return radius;

}

public void setRadius(double radius) {

this.radius = radius;

}

// Abstract method to calculate the volume public abstract double calculateVolume();

}

(ii) Write the Java Definition of class CylindricalContainer. (Implement the

Methods)

# Answer

public class CylindricalContainer extends Container {

private static final double PI = 3.14159;

public CylindricalContainer(double height, double radius) { super(height, radius);

}

@Override

public double calculateVolume() {

double volume = PI \* getRadius() \* getRadius() \* getHeight(); return volume;

}

}

(iii) Create an object from CylindricalContainer and display the volume.

# Answers

public class Main {

public static void main(String[] args) { double height = 10.0;

double radius = 5.0;

**// Create an object of CylindricalContainer**

CylindricalContainer container = new

CylindricalContainer(height, radius);

// Calculate the volume using the calculateVolume() method double volume = container.calculateVolume();

// Display the volume

System.out.println("Volume of the cylindrical container: " + volume);

}

}

**Finally output**

# Volume of the cylindrical container: 785.3975

**Question 02**

A Student wants to create a game called “Life”, ‘life’ is a RPG game in which a player can move up, down, left & Right. In order to implement this game assume that you need to create an abstraction of the player controllers. Make sure to print the directions of the player when keys are pressed.

## Answers

public interface PlayerController { void moveUp(); void moveDown(); void moveLeft(); void moveRight();

}

public class LifeGame implements PlayerController {

@Override

public void moveUp() {

System.out.println("Player moved UP.");

}

@Override

public void moveDown() {

System.out.println("Player moved DOWN.");

}

@Override

public void moveLeft() {

System.out.println("Player moved LEFT.");

}

@Override public void moveRight() {

System.out.println("Player moved RIGHT.");

}

}

public class Main { public static void main(String[] args) {

LifeGame game = new LifeGame();

// Test player movements game.moveUp(); game.moveLeft(); game.moveDown();

game.moveRight();

}

}

## Output

**Player moved “UP”.**

**Player moved “LEFT”.**

**Player moved “DOWN”.**

**Player moved “RIGHT”.**