



Name: \_\_\_\_\_ ID: \_\_\_\_\_ Section: \_\_\_\_\_

(There are 2 questions only. You must answer both.)

- Q1.** Carefully observe the following driver code and expected output to design the **Customer** class. Here, each customer's cart can contain 4 items at max.

[8 Marks]

Driver Code	Expected Output
<pre>public class MockMidTest {     public static void main(String[] args) {         Customer rashid = new Customer("Rashid");         rashid.addToCart("Backpack", 560);         System.out.println("1=====1");          System.out.println(rashid.details());         Customer chaya = new Customer("Chaya", "Azimpur");         System.out.println("2=====2");          chaya.addToCart("Notebook", 70);         String[] a = { "Pens", "Steel Ruler", "Eraser" };         int[] b = { 50, 50, 20 };         int[] cost = { 50, 30 };         chaya.addToCart(a, cost);         System.out.println("3=====3");          System.out.println(chaya.details());         rashid.addToCart(a, b);         System.out.println("4=====4");          rashid.addToCart("Books", 300);         rashid.address = "Rampura";         System.out.println(rashid.details());         System.out.println("5=====5");          chaya.addToCart("Pencils", 30);         chaya.addToCart("Stapler", 120);         System.out.println("6=====6");          chaya.addToCart(a, b);         System.out.println("7=====7");          System.out.println(chaya.details());         System.out.println("8=====8");     } }</pre>	<pre>Welcome, Rashid! Rashid added Backpack to cart. 1=====1 Shopping details for Rashid Items: Backpack Delivery location: not set --&gt; Cost: 560.0 Welcome, Chaya! 2=====2 Chaya added Notebook to cart. Error: Items and Cost Mismatched. 3=====3 Shopping details for Chaya Items: Notebook Delivery location: Azimpur --&gt; Cost: 70.0 Rashid added Pens to cart. Rashid added Steel Ruler to cart. Rashid added Eraser to cart. 4=====4 Rashid cannot add Books to cart before payment. Shopping details for Rashid Items: Backpack, Pens, Steel Ruler, Eraser Delivery location: Rampura --&gt; Cost: 680.0 5=====5 Chaya added Pencils to cart. Chaya added Stapler to cart. 6=====6 Chaya added Pens to cart. Chaya cannot add Steel Ruler to cart before payment. Chaya cannot add Eraser to cart before payment. 7=====7 Shopping details for Chaya Items: Notebook, Pencils, Stapler, Pens Delivery location: Azimpur --&gt; Cost: 270.0 8=====8</pre>

**Q2.** Carefully Trace the following main method of tracing1 class and find the outputs:  
(you must show the complete tracing table on your paper)

[7 Marks]

		OUTPUTS		
1	public class tracing1 {			
2	public static void main(String[] args) {	18	-3	5
3	MidTest p = new MidTest();	1	9	10
4	int[] r = { 3, 0, 7 };	30	3	27
5	p.method(9, 1);			
6	p.r = r;			
7	r[0] = p.method(p.a + p.b);			
8	}			
9	}			
10	class MidTest {			
11	public int a = 7, b = 3;			
12	public int[] r = { 5, 2 };			
13	public int method(int n) {			
14	this.b = (r[(n + (b--)) % 2]) - r[1];			
15	a = r[0] + r[1] + n;			
16	System.out.println(a + " " + b + " " + n);			
17	return a + this.b;			
18	}			
19	public void method(int n, int a) {			
20	r[1] = a + b + 4;			
21	r[0] += this.r[a] + this.method(r[0]);			
22	b = this.a - (n++);			
23	System.out.println(a + " " + b + " " + n);			
24	}			
25	}			

— End —



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(There are 2 questions only. You must answer both.)

- Q1.** Carefully observe the following driver code and expected output to design the **Customer** class. Here, each customer's cart can contain 4 items at max.

[8 Marks]

Driver Code	Expected Output
<pre>public class MockMidTest {     public static void main(String[] args) {         Customer rashid = new Customer("Rashid");         rashid.addToCart("Backpack", 560);         System.out.println("1=====1");          System.out.println(rashid.details());         Customer chaya = new Customer("Chaya", "Azimpur");         System.out.println("2=====2");          chaya.addToCart("Notebook", 70);         String[] a = { "Pens", "Steel Ruler", "Eraser" };         int[] b = { 50, 50, 20 };         int[] cost = { 50, 30 };         chaya.addToCart(a, cost);         System.out.println("3=====3");          System.out.println(chaya.details());         rashid.addToCart(a, b);         System.out.println("4=====4");          rashid.addToCart("Books", 300);         rashid.address = "Rampura";         System.out.println(rashid.details());         System.out.println("5=====5");          chaya.addToCart("Pencils", 30);         chaya.addToCart("Stapler", 120);         System.out.println("6=====6");          chaya.addToCart(a, b);         System.out.println("7=====7");          System.out.println(chaya.details());         System.out.println("8=====8");     } }</pre>	<pre>Welcome, Rashid! Rashid added Backpack to cart. 1=====1 Shopping details for Rashid Items: Backpack Delivery location: not set --&gt; Cost: 560.0 Welcome, Chaya! 2=====2 Chaya added Notebook to cart. Error: Items and Cost Mismatched. 3=====3 Shopping details for Chaya Items: Notebook Delivery location: Azimpur --&gt; Cost: 70.0 Rashid added Pens to cart. Rashid added Steel Ruler to cart. Rashid added Eraser to cart. 4=====4 Rashid cannot add Books to cart before payment. Shopping details for Rashid Items: Backpack, Pens, Steel Ruler, Eraser Delivery location: Rampura --&gt; Cost: 680.0 5=====5 Chaya added Pencils to cart. Chaya added Stapler to cart. 6=====6 Chaya added Pens to cart. Chaya cannot add Steel Ruler to cart before payment. Chaya cannot add Eraser to cart before payment. 7=====7 Shopping details for Chaya Items: Notebook, Pencils, Stapler, Pens Delivery location: Azimpur --&gt; Cost: 270.0 8=====8</pre>

**Q2.** Carefully Trace the following main method of tracing1 class and find the outputs:  
(you must show the complete tracing table on your paper)

[7 Marks]

1	public class tracing1 {	OUTPUTS		
2	public static void main(String[] args) {	22	-1	7
3	MidTest p = new MidTest();	1	13	10
4	int[] r = { 5, 2, -1 };	42	3	35
5	p.method(9, 1);			
6	p.r = r;			
7	r[0] = p.method(p.a + p.b);			
8	}			
9	}			
10	class MidTest {			
11	public int a = 2, b = 3;			
12	public int[] r = { 7, 2 };			
13	public int method(int n) {			
14	this.b = (r[(n + (b--)) % 2]) - r[1];			
15	a = r[0] + r[1] + n;			
16	System.out.println(a + " " + b + " " + n);			
17	return a + this.b;			
18	}			
19	public void method(int n, int a) {			
20	r[1] = a + b + 4;			
21	r[0] += this.r[a] + this.method(r[0]);			
22	b = this.a - (n++);			
23	System.out.println(a + " " + b + " " + n);			
24	}			
25	}			

— End —

// SOLUTION:

```
class Customer {
    String name;
    String address;
    String[] cart;
    int count;
    double cost;

    Customer(String name) {
        System.out.println("Welcome, " + name + "!");
        this.name = name;
        address = "not set";
        this.cart = new String[4];
    }

    Customer(String name, String address) {
        System.out.println("Welcome, " + name + "!");
        this.name = name;
        this.address = address;
        this.cart = new String[4];
    }

    String details() {
        String out = "Shopping details for " + name;
        out += "\nItems: ";
        if (count == 0) {
            out += "None";
        } else {
            for (int i = 0; i < count; i++) {
                out += cart[i];
                if (i != count - 1) {
                    out += ", ";
                }
            }
        }
        out += "\nDelivery location: " + address;
        out += "\n--> Cost: " + cost;
        return out;
    }

    void addToCart(String item, int cost) {
        if (count < cart.length) {
            cart[count++] = item;
            this.cost += cost;
            System.out.println(name + " added " + item + " to cart.");
        } else {
            System.out.println(name + " cannot add " + item + " to cart before payment.");
        }
    }
}
```

```

}

void addToCart(String[] items, int[] costs) {
    if (costs.length != items.length) {
        System.out.println("Error: Items and Cost Mismatched.");
    } else {
        for (int i = 0; i < items.length; i++) {
            this.addToCart(items[i], costs[i]);
        }
    }
}
}
}
}

```

```

public class MockMidTest {
    public static void main(String[] args) {
        Customer rashid = new Customer("Rashid");
        rashid.addToCart("Backpack", 560);
        System.out.println("1=====1");

        System.out.println(rashid.details());
        Customer chaya = new Customer("Chaya", "Azimpur");
        System.out.println("2=====2");

        chaya.addToCart("Notebook", 70);
        String[] a = { "Pens", "Steel Ruler", "Eraser" };
        int[] b = { 50, 50, 20 };
        int[] cost = { 50, 30 };
        chaya.addToCart(a, cost);
        System.out.println("3=====3");

        System.out.println(chaya.details());
        rashid.addToCart(a, b);
        System.out.println("4=====4");

        rashid.addToCart("Books", 300);
        rashid.address = "Rampura";
        System.out.println(rashid.details());
        System.out.println("5=====5");

        chaya.addToCart("Pencils", 30);
        chaya.addToCart("Stapler", 120);
        System.out.println("6=====6");

        chaya.addToCart(a, b);
        System.out.println("7=====7");

        System.out.println(chaya.details());
        System.out.println("8=====8");
    }
}

```