BRAC University
Department of Computer Science and Engineering (CSE)

CSE470: Software Engineering

SET - A

Semester: **Summer 2025**
Examination: **Quiz 4**

Time: **25 minutes**
Full marks: **15**

Name: _____ **ID**: _____ **Section**: **8**

Read the code and answer the following questions:

Python

```
class Human:
    def eat(self):
        print("Human Eats")
    def sleep(self):
        print("Human Sleeps")

class BRACUStudent(Human):
   def verify(self):
        print("Student Verifies")
    def study(self):
        print("Student Studies")

class CSEStudent(BRACUStudent):
    def study(self):
        print("Student studies CSE")

    def lab_problem(self):
    a = input("Enter a number")
    b = input("Enter another number")
    while(a>b):
        x = input("Enter a number")
        if (x%2 == 0):
            print("Even Number")
        else:
            count=0
            for i in range(1,x+1):
                if(x%i == 0):
                    count+=1
            if count == 2:
                print("Prime Number")
            else:
                print("Not Prime")
```

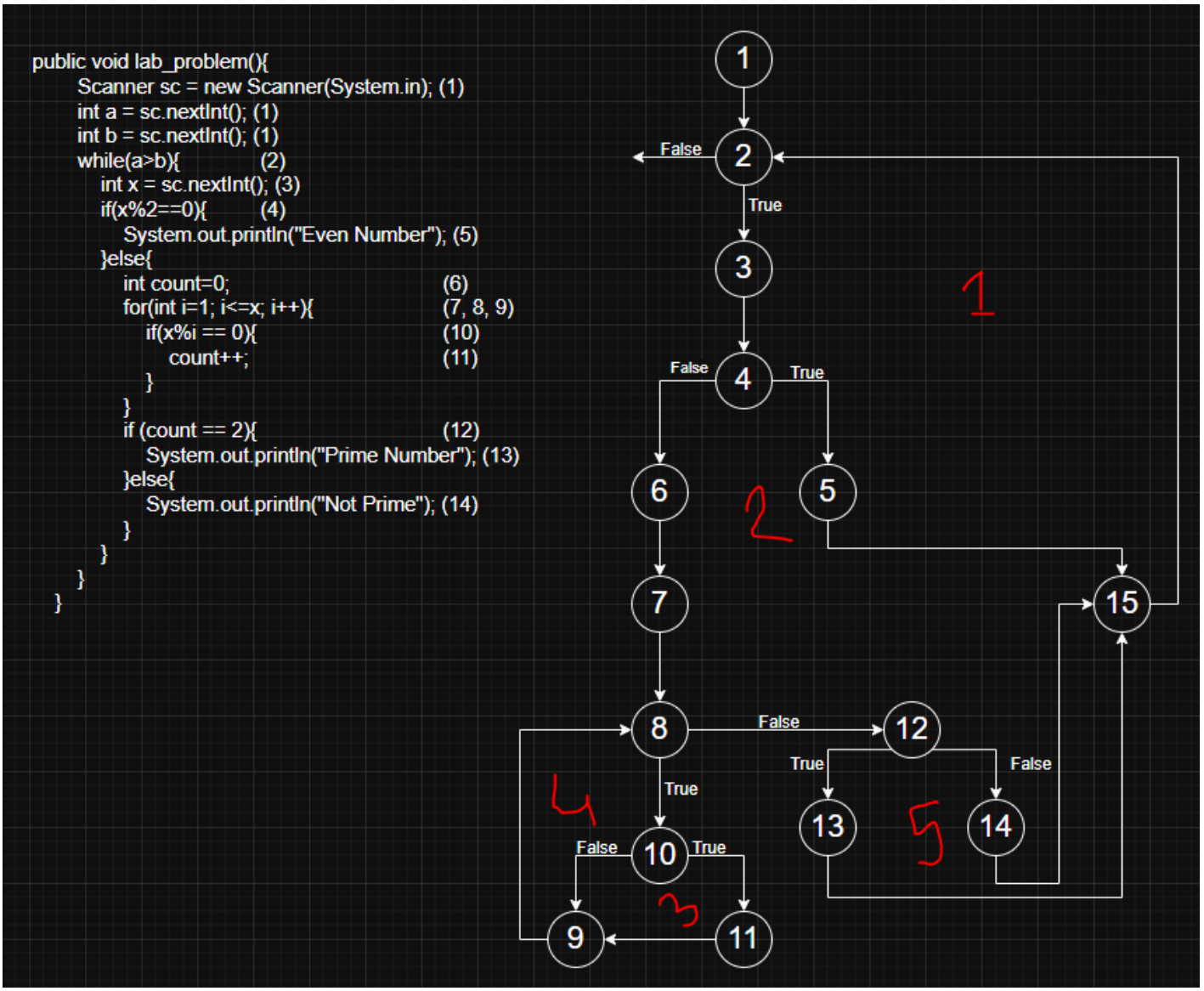
Java

```
public class Human {
    public void eat(){
        System.out.println("Human Eats");
    }
    public void sleep(){
        System.out.println("Human Sleeps");
    }
}
public class BRACUStudent extends Human{
    public void verify(){
    System.out.println("Student Verifies");
    }
    public void study(){
        System.out.println("Student Studies");
    }
}
public class CSEStudent extends BRACUStudent{
    public void study(){
        System.out.println("Student studies CSE");
    }
    public void lab_problem(){
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        while(a>b){
            int x = sc.nextInt();
            if(x%2==0){
                System.out.println("Even Number");
            }else{
                int count=0;
                for(int i=1; i<=x; i++){
                    if(x%i == 0){
                        count++;
                    }
                }
                if (count == 2){
                    System.out.println("Prime Number");
                }else{
                    System.out.println("Not Prime");
                }
            }
        }
    }
}
```

A. Answer the following questions for the "lab_problem" method:

1. Write the nodes on the question paper and draw the CFG [1+4]
2. Find out all the independent paths in your CFG [4]
3. Calculate the Cyclomatic Complexity [3]
4. Write a testcase to recreate a path that has greater than or equal to 5 nodes [1]

B. Calculate Specialization Index (SIX) for the CSEStudent class [2]



Complexity = 5+1 = 5+1 = 19-15+2 = 6

SIX:
Human → BRACUStudent → CSEStudent
DIT = 2, NMA (lab_problem) = 1, NMI (verify, eat, sleep) = 3, NMO (study) = 1

SIX =((2*1)/(1+3+1))*100% = 40%

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SET - B

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Name: _____ **ID**: _____ **Section**: **8**

Read the code and answer the following questions:

Python

```
class SultansDine:
    def kacchi(self):
        print("Sells Kacchi")
    def tehari(self):
        print("Sells Tehari")
    def morog_polao(self):
        print("Sells Morog polao")
    def tough_calculation(self):
        a = input("Enter a number")
        b = input("Enter another number")
        while(a>b):
            x = input("Enter a number")
            if (x%2 == 0):
                count = 0
                for i in range(1, x):
                    if (i*i == x):
                        count+=1
                if count == 1:
                    print("Perfect Square")
                else:
                    print("Not Perfect Square")
            else:
                print("Odd Number")

class Banani(SultansDine):
    def tehari(self):
        print("Does not sell Tehari")
    def wedding_platter(self):
        print("Sells Wedding Platter")

class Gulshan(SultansDine):
    def kacchi(self):
        print("Does not sell Kacchi")
    def chaap(self):
        print("Sells Chaap")
```

Java

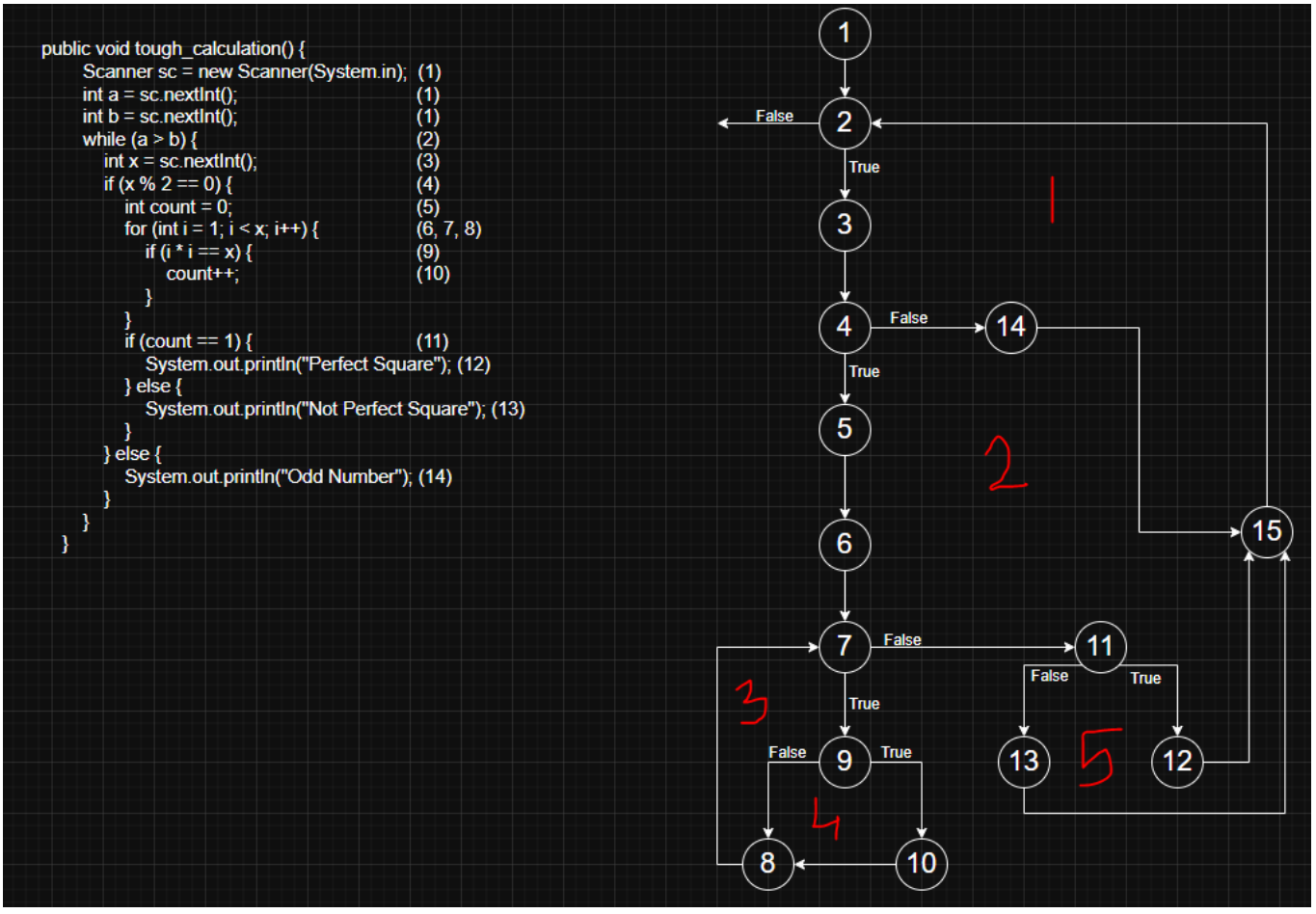
```
class SultansDine {
    public void kacchi() {
        System.out.println("Sells Kacchi");
    }
    public void tehari() {
        System.out.println("Sells Tehari");
    }
    public void morog_polao() {
        System.out.println("Sells Morog Polao");
    }
    public void tough_calculation() {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        while (a > b) {
            int x = sc.nextInt();
            if (x % 2 == 0) {
                int count = 0;
                for (int i = 1; i < x; i++) {
                    if (i * i == x) {
                        count++;
                    }
                }
                if (count == 1) {
                    System.out.println("Perfect Square");
                } else {
                    System.out.println("Not Perfect Square");
                }
            } else {
                System.out.println("Odd Number");
            }
        }
    }
}
public class Banani extends SultansDine{
    public void tehari(){
        System.out.println("Does not sell Tehari");
    }
    public void wedding_platter(){
        System.out.println("Sells Wedding Platter");
    }
```

	}
	
	public class **Gulshan** extends SultansDine{
	  public void kacchi(){
	  System.out.println("Does not sell kacchi");
	  }
	  public void chaap(){
	  System.out.println("Sells Chaap");
	  }
	}

A. Answer the following questions for the "tough_calculation" method:

1. Write the nodes on the question paper and draw the CFG [1+4]
2. Find out all the independent paths in your CFG [4]
3. Calculate the Cyclomatic Complexity [3]
4. Write a testcase to recreate a path that has greater than or equal to 5 nodes [1]

B. Calculate Specialization Index (SIX) for the Gulshan class [2]



Complexity = 5+1 = 5+1 = 19-15+2 = 6

SIX: SultansDine → Banani, SultansDine → Gulshan
DIT = 1, NMA (chaap) = 1, NMI (tehari, morog_polao, tough_calc) = 3, NMO (kacchi) = 1

SIX =((1*1)/(1+3+1))*100% = 20%