a. Menu that uses Do-while structure for enabling the user to choose any of the following options:

1. View coursework results
2. View exam results
3. Exit the program

```java
import java.util.Scanner;

public class Exam {
```

```java
    public static void main(String[] args){

        // Declare the variables
        double ass1, ass2, ass3, cat1, cat2, course_work, exam_result;
        int course_work_done, userinput;

        // Initialize the variables
        ass1 = 4;
        ass2 = 0;
        ass3 = 10;
        cat1 = 15;
        cat2 = 12;
        exam_result = 37;
        course_work = ass1 + ass2 + ass3 + cat1 + cat2;
```

```java
        // New Scanner object
        Scanner scanner = new Scanner(System.in);

        // This block allows the user to interact with the program by collecting input responding with the oappropriate output.
        do {

            System.out.println("\nThe Main Menu\n1: Course Work\n2: Exam Results\n3: Exit\nType any of the choices available");
            userinput = scanner.nextInt();

            if(userinput == 1){
                System.out.println("\nCourse Work: " + course_work);
            } else if(userinput == 2){
                System.out.println("\nExam Results: " + exam_result);
            } else if(userinput == 3){
                System.out.println("\nExit");
                break;
            } else{
                System.out.println("\nInvalid Input");
            }


        } while(userinput != 0 && userinput <= 3);

        // Close the scanner
        scanner.close();
```

```java
    }
}
```

```
D:\dev\javaproj\DIT409\java-assignment2>java Exam

The Main Menu
1: Course Work
2: Exam Results
3: Exit
Type any of the choices available
```

```
D:\dev\javaproj\DIT409\java-assignment2>java Exam

The Main Menu
1: Course Work
2: Exam Results
3: Exit
Type any of the choices available
1
```

```
 Course Work: 41.0

 The Main Menu
 1: Course Work
 2: Exam Results
 3: Exit
 Type any of the choices available
 2
```

```
  Exam Results: 37.0

  The Main Menu
  1: Course Work
  2: Exam Results
  3: Exit
  Type any of the choices available
  3
```

```
 1: Course Work
 2: Exam Results
 3: Exit
 Type any of the choices available
 3

 Exit

 D:\dev\javaproj\DIT409\java-assignment2>
```

```
D:\dev\javaproj\DIT409\java-assignment2>java Exam

The Main Menu
1: Course Work
2: Exam Results
3: Exit
Type any of the choices available
4
```

```
 1: Course Work
 2: Exam Results
 3: Exit
 Type any of the choices available
 4

 Invalid Input

 D:\dev\javaproj\DIT409\java-assignment2>
```

b. Counting function that uses for- loop to compute the number of course work assessments done in DIT409 unit.

```java
public class Exam {

    public int course_work_done(double ass1, double ass2, double ass3, double cat1, double cat2) {
        int course_works;
        course_works = 0;
        // Check how many courseworks have been done

        for(int x = 1; x <= 1; x++){

            if(ass1 != 0){
                course_works += x;
            }

            if(ass2 != 0){
                course_works += x;
            }

            if(ass3 != 0){
                course_works += x;
            }

            if(cat1 != 0){
                course_works += x;
            }
```

```java
            if(cat2 != 0){
                course_works += x;
            }

        }

        return course_works;
    }
```

```java
    public static void main(String[] args){

        // Declare the variables
        double ass1, ass2, ass3, cat1, cat2, course_work, exam_result;
```

```java
    // Initialize the variables
    ass1 = 4;
    ass2 = 0;
    ass3 = 10;
    cat1 = 15;
    cat2 = 12;
    exam_result = 37;
```

```java
        Exam exam = new Exam();
        System.out.println(exam.course_work_done(ass1, ass2, ass3, cat1, cat2));

    }
}
```

```
D:\dev\javaproj\DIT409\java-assignment2>java Exam
4

D:\dev\javaproj\DIT409\java-assignment2>
```

c. Decision function that use results obtained in Q(b) to determine whether a student has done 2/3 of coursework. If not, the student is required to repeat irrespective of Final Exam Grade.

```java
public class Exam {

    public int course_work_done(double ass1, double ass2, double ass3, double cat1, double cat2) {
        int course_works;
        course_works = 0;
        // Check how many courseworks have been done

        for(int x = 1; x <= 1; x++){

            if(ass1 != 0){
                course_works += x;
            }

            if(ass2 != 0){
                course_works += x;
            }

            if(ass3 != 0){
                course_works += x;
            }

            if(cat1 != 0){
                course_works += x;
            }

            if(cat2 != 0){
                course_works += x;
            }
```

```java
        }

        return course_works;
    }

    public boolean has_passed(double ass1, double ass2, double ass3, double cat1, double cat2) {
        double pass_mark;
        pass_mark = 2/3 * 100;

        Exam exam = new Exam();

        if (exam.course_work_done(ass1, ass2, ass3, cat1, cat2) >= pass_mark){
            return true;
        } else {
            return false;
        }
    }
```

```java
    public static void main(String[] args){

        // Declare the variables
        double ass1, ass2, ass3, cat1, cat2, course_work, exam_result;
        int course_work_done;

        // Initialize the variables
        ass1 = 4;
        ass2 = 0;
        ass3 = 10;
        cat1 = 15;
        cat2 = 12;
        exam_result = 37;
        course_work = ass1 + ass2 + ass3 + cat1 + cat2;
```

```java
        Exam exam = new Exam();
        System.out.println(exam.has_passed(ass1, ass2, ass3, cat1, cat2));

    }
}
```