SECTION ONE

QUESTION ONE [30 Marks]

a) Apart from the object-oriented programming style, state and explain the features of three other programming styles.

[6 Marks]

b) Explain how information hiding through abstraction is achieved in an object-oriented programming language like Java. Be sure to include an appropriate example of your own choice to justify/demonstrate your explanation.

[8 Marks]

c) Describe how polymorphism is achieved in an object-oriented programming language like Java. Be sure to include an appropriate example of your own choice to justify/demonstrate your explanation.

[8 Marks]

d) Using an example of your own choice, differentiate between setter and getter methods as used in object-oriented programming. Be sure to clearly explain your example as you bring out how "objects" are created and used in OOP.

[8 Marks]

SECTION TWO

QUESTION TWO [20 Marks]

a) Using an example(s) of your own choice, explain the similarity among the for loop, while loop and the do ... while loop as applied in OOP flow control.

[12 Marks]

b) Using an example, demonstrate the process of reading from a text file using an object-oriented programming language like Java.

[8 Marks]

QUESTION THREE [20 Marks]

Consider a program that prompts for two integer values from the console then stores them in two variables x and y. It should then divide x by y as it stores the results in variable z.

a) What to potential reasons could make such a program to crush at runtime? Why?

[6 Marks]

b) Write the program with proper mechanisms that take care of the two potential crushes. Be sure to explain your program.

[14 Marks]

QUESTION FOUR [20 Marks]

a) Consider a one class Java program with two value-returning methods area() and perimeter(). Let the program prompt the user for the radius of a circle through main(). It should then compute the area and perimeter from respective methods. The program should then display the values returned to main(). Let the output be as follows.

```
Enter Radius:
The area is ___ cm²
The perimeter is ___ cm
```

[10 Marks]

b) Consider the following UML diagram

Rectangle
+length
+width
+main()

Computation
-perimeter
+setPerimeter()
+getPerimeter()
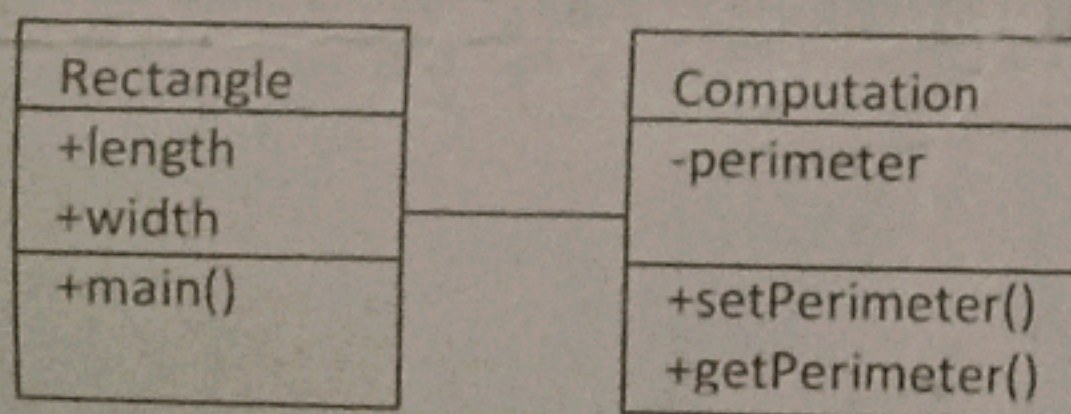
Write a java program that implements the model

[10 Marks]

QUESTION FIVE [20 Marks]

a) Using an example of your own choice, explain how the "nested if ... else statement" and the "switch statement" can be used interchangeably.

[10 Marks]

b) Create a class named Employee with a name and a salary. Make a class named Manager that inherits from Employee with an instance field named department. Supply a toString() method that prints the manager's name, department, and salary. Make another class named Director that inherits from Manager with an instance field named stipendAmount. Supply the toString() method for Director that prints all of its instance variables. Also, write a program named myOutput that instantiates an object of each of the classes and invokes the toString() method of each of the objects.

[10 Marks]