Encapsulation

Q1) What is Encapsulation? Why is it called Data hiding?

Ans) Encapsulation is a fundamental concept in object-oriented programming (OOP) that refers to the practice of bundling data & methods that operate on that data within a single unit, typically a class. It is implemented through the use of access modifiers such as public, private and protected, which control the visibility of class members.

Encapsulation is called data hiding because it helps to protect the internal state of an object from being accessed or modified directly by other code outside the class.

Q2) What are the important features of Encapsulation?

Ans)

1) Data hiding
2) Access Control
3) Abstraction
4) Modularity
5) Security
6) Reusability.

(Q3) What are getter & setter methods in Java, Explain with an example.

Ans) Getter & setter methods are used in Java to access and modify the value of private fields in a class.

Eg

```
public class Person {
    private String name;
    private int age;

    public String getName() {
        return name;
    }
public int getAge() {
    return age;
    }
public void setName(String name) {
    this.name = name;
    }
public void setAge(int age) {
    this.age = age;

public static void main(String[] args) {
    Person person = new Person();

    person.setName("John");
    person.setAge("30");
    System.out.println("Name" + person.getName());
    System.out.println("Age" + person.getAge());
}
```

Q4) what is use of this keyword, Explain with an example?

Ans) In Java, the 'this' keyword refers to the current object of a class. It is often used to differentiate between instance variables and local variables that have the same name.

Eg

```
Public class Person {
    private String name;

    Public Person (String name) {
        this.name = name;
    }
    Public string getName () {
        return this.name;
    }
```

=> name refers to local Variable
=> to assign value to name, we use this.name.
=> this.name refers to instance Variable.

Q5) what is the advantage of Encapsulation?

Ans) 1) Data Protection
2) Modularity
3) information hiding
4) Reusability
5) Security.

Q6) How to achieve encapsulation in Java? Give an example?

Ans) Encapsulation in Java is achieved through the use of access modifiers such as private, public, protected & default -

Eg -

```
public class BankAccount {
    private double balance;

public BankAccount(double initialBalance){
        balance = initialBalance;
    }
public double getBalance(){
        return balance;
    }
public void deposit(double amount){
        balance += amount;
    }
public void withdraw(double amount){
        if (balance >= amount){
            balance -= amount; }
        else {
            System.out.println("Insufficient funds");
        }
    }
}
```