**MODULE: 4**

**OOPS Concept**

**Basic Concepts of OOP**

1. **What is OOP? List OOP concepts.**

**Ans. OOPs** stands for **Object Oriented Programming System**. It is centred around objects, which are instances of classes. A class acts as a blueprint for creating objects and defines their properties (attributes) and behaviours (methods).

The earlier approaches to programming were not that good, and there were several limitations as well. Like in procedural-oriented programming, you cannot reuse the code again in the program, and there was the problem of global data access, and the approach couldn’t solve real-world problems very well.

There are some basic concepts that act as the building blocks of OOPs.

* Classes & Objects
* Abstraction
* Encapsulation
* Inheritance
* Polymorphism
* **Object :**

An Object can be defined as an entity that has a state and behaviour, or in other words, anything that exists physically in the world is called an object. It can represent a dog, a person, a table, etc. An object means a combination of data and programs, which further represent an entity.

* **Class :**

Class can be defined as a blueprint of the object. It is basically a collection of objects which act as building blocks. A class contains data members (variables) and member functions. These member functions are used to manipulate the data members inside the class.

* **Abstraction**

Abstraction helps in the data-hiding process. It helps in displaying the essential features without showing the details or the functionality to the user. It avoids unnecessary information or irrelevant details and shows only that specific part that the user wants to see.

* **Encapsulation :**

The wrapping up of data and functions together in a single unit is known as encapsulation. It can be achieved by making the data members' scope private and the member function’s scope public to access these data members. Encapsulation makes the data non-accessible to the outside world.

* **Inheritance :**

Inheritance is the process in which two classes have an is-a relationship among each other and objects of one class acquire properties and features of the other class. The class which inherits the features is known as the child class, and the class whose features it inherited is called the parent class.

* **Polymorphism :**

Polymorphism means many forms. It is the ability to take more than one form. It is a feature that provides a function or an operator with more than one definition. It can be implemented using function overloading, operator overload, function overriding, and virtual functions.

1. **What is the difference between OOP and POP?**

| OOP | POP |
| --- | --- |
| Object oriented. | Structure oriented. |
| Program is divided into objects. | Program is divided into functions. |
| Bottom-up approach. | Top-down approach. |
| Inheritance property is used. | Inheritance is not allowed. |
| Encapsulation is used to hide the data. | No data hiding. |
| Adding new data and functions is easy | Expanding new data and functions is not easy. |
| The existing code can be reused. | No code reusability. |
| use for solving big problems. | Not suitable for solving big problems. |
| C++, Java. | C, Pascal. |