MODULE : 4

OOPS Concept

1. What is OOP? List OOP concepts

* OOP stands for Object Oriented programming. It’s a programming paradigm that organizes data and behavior into reusable, self-contained objects. Objects are instances of classes, which encapsulate data for the object and methods to manipulate that data. OOP promotes concepts like encapsulation, inheritance, and polymorphism, making it easier to model real-world entities and their interactions in software development.

**Object-Oriented Programming (OOP)**

1. **Classes and objects:** Classes are blueprint templates for creating objects, instances of classes, representing real-word entities and encapsulating data and behavior.
2. **Encapsulation:** Encapsulation is the bundling of data and methods that can operate on the object’s data.
3. **Inheritance: I**t allows a class to inherit properties and behaviors from another class. Itpromotes code reusability and establishes a relationship between classes.
4. **Encapsulation:** It is the bundling of the data and the methods that operate on the data into a single unit known as a class. It hides the internal state of the object from the outside world and only allows access through public methods.
5. **Polymorphism:** It allows objects of different classes to be treated as objects of a common superclass. This enables methods to operate differently based on the object they are called on promoting flexibility and extensibility in the code.
6. **Abstraction:** it is the process of hiding the complex reality while exposing only the essential parts, in OOP, abstraction refers to creating abstract classes and methods that must be implemented by derived classes. It provides a blueprint for classes and helps manage complexity in larges software projects.

**Methode Overloading:** It allows defining multiple methods with the same class but with different parameters. The appropriate method is called based on the number and types of arguments passed, enabling flexibility in method invocation.

**Q.2 What is OOP? List OOP concepts**

* Object-Oriented programming (OOP) is a programming paradigm that uses objects and classes for organizing code. In OOP objects are instances of classes, and these objects can encapsulate data in the form of methods. Here are some key concepts and connection in Object-Oriented Programming.

**1. Class:** A class is a blueprint or template for creating objects. It defines the attributes and methods common to all objects of the class.

**2. Object:** An object is an instance of a class. It represents a real-world entity and encapsulates data and behaviors.

**3.Inheritance:** Inheritance is a mechanism where one class can inherit properties and methods from another class. It promotes code reuse and establishes a relationship between classes.

**4. Encapsulation:** Encapsulation is the bundling of data and methods that operate on the data into a single unit known as a class. It protects the data from unauthorized access and modification.

**5. Polymorphism:** Polymorphism allows objects of different classes to be treated as objects of different classes to be treated as objects of a common superclass. It enables the use of a single interface to represent different underlying forms data types.

**6. Abstraction:** Abstraction is the concept of hiding the complex reality while exposing only involves creating abstract classes and methods , providing a clear and concise interface for working with objects.

**7. Methode overloading:** Methode overloading allow a class to have multiple methods with the same name but different parameter. The appropriate method is called based on the nubmer or type of parameters passed to it.

**8. Method Overriding:** Methode Overriding occurs when a subclass provides a specific implementation for a method that is already defined in its superclass. It allows a subclass to provide a specialized version of a method.