What is OOP? List OOP concepts .

Object-oriented programming (OOP) is a computer programming model that organizes code around objects, rather than functions and logic.

List oop concepts:-

- Class
- Object
- Encapsulation
- Inheritance
- Polymorphism
- Abstraction

• Class:-

• A blueprint or template for creating objects. It defines the attributes and methods that objects will have.

• Object:-

• An instance of a class. It contains data and functions defined in the class.

• Encapsulation :-

• Bundling data (attributes) and methods within an object, protecting data from unauthorized access.

• This concept promotes data security and prevents accidental modification.

• Encapsulation is achieved by making class attributes private and providing public methods to access or modify them.

• Inheritance:-

• Creating new classes (derived classes) based on existing classes (base classes), inheriting their attributes and methods.

• This allows for code reuse and the creation of hierarchical relationships between classes. For example, a "Sports Car" class could inherit from the "Car" class, inheriting its attributes and methods while adding new ones specific to sports cars.

• Type of Inheritance :-

- Simple Inheritance
- Multilevel Inheritance
- Multiple Inheritance
- Hierarchical Inheritance
- Hybrid Inheritance

• Polymorphism :-

• The ability of objects to take on multiple forms, allowing different objects to be treated as if they were the same type.

• This is achieved through method overriding, where a derived class provides a different implementation of a method inherited from its base class.

• Polymorphism enables you to write generic code that can work with objects of different types.

• Type of Polymorphism :-

1. compile time polymorphism :-

- Constructor overloading
- Function overloading

• Operator overloading

2. Run time polymorphism :-

• Function Overloading

• Abstraction

• Abstraction is the process of only showing the necessary details to the user and hiding the other details in the background.

• Control and data are the two types of abstraction in C++.

• Abstraction in C++ is achieved through classes, header files, and access specifiers (public, private, protected)