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

The main ideas behind Java's Object-Oriented Programming, OOP concepts include abstraction, encapsulation, inheritance and polymorphism. Basically, Java OOP concepts let us create working methods and variables, then re-use all or part of them without compromising security.

**List oop concept**

**• Abstraction.**

**• Inheritance.**

**• Polymorphism.**

**• Encapsulation**

**1).abstraction :-** Abstraction refers to showing only the essential features of the application and hiding the details. In C++, classes can provide methods to the outside world to access & use the data variables, keeping the variables hidden from direct access, or classes can even declare everything accessible to everyone, or maybe just to the classes inheriting it. This can be done using access specifiers.

**2). Inheritance :-** Inheritance is a way to reuse once written code again and again. The class which is inherited is called the Base class & the class which inherits is called the Derived class. They are also called parent and child class.

**3). Polymorphism :-** It is a feature, which lets us create functions with same name but different arguments, which will perform different actions. That means, functions with same name, but functioning in different ways. Or, it also allows us to redefine a function to provide it with a completely new definition. You will learn how to do this in details soon in coming lessons.

**4). Encapsulation :-** It can also be said data binding. Encapsulation is all about binding the data variables and functions together in class.

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

* **Object-Oriented Programming (OOP):-**

• OOP treats data as a critical element in the program development and does not allow it to flow freely around the system.

• In OOP, the major emphasis is on data rather than procedure (function).

• It ties data more closely to the function that operate on it, and protects it from accidental modification from outside function.

• OOP allows decomposition of a problem into a number of entities called objects and then builds data and function around these objects.

• The data of an object can be accessed only by the function associated with that object. However, function of one object can access the function of other objects.

• C++, Java, Dot Net, Python etc are the example of Object oriented programming (OOP) language.

**Features of OOP :-**

1. Class

2. Object

3. Encapsulation

4. Data Abstraction

5. Inheritance

6. Polymorphism

7. Data binding

8. Message Passing

**Application of Object Oriented Programming:-**

• User interface design such as windows, menu

• Real Time Systems such as Control system for cars, aircraft, space vehicles etc

• Office automation system such as Document Management System i.e. Word processing system, spread sheet software etc

• AI and Expert System

• Neural Networks and parallel programming System

• Decision support system

* **Procedural Oriented Programming (POP) :-**

• In the procedure oriented approach, large programs are divided into smaller programs known as functions.

• In POP, a program is written as a sequence of procedures or function.

• In POP, each procedure (function) contains a series of instructions for performing a specific task.

• During the program execution each procedure (function) can be called by the other procedures.

• To call a procedure (function), we have to write function name only.

• While we concentrate onto the development of functions, we give very little attention to the data that are being used by various functions.

• In POP, the major emphasis is on procedure (function) and not on the data.

• In a multi-function program, many important data items are placed as global so that they may be accessed by all the functions. Each function may have its own local data.

• Global data are more vulnerable to an accidental change by a function. In a large program it is very difficult to identify what data is used by which function.

• Examples of procedural oriented programming language are COBOL, FORTRAN, PASCAL, C programming language etc.

**Characteristics of procedure-oriented programming :-**

• Large programs are divided into smaller programs known as functions.

• Most of the functions share global data.

• Data move openly around the system from function to function.

• Functions change the value of data at any time from any place. (Functions transform data from one form to another.)

• It uses top-down approach in program desig