

## **Paper- II : Object Oriented Programming using C++**

### **UNIT – I**

Different paradigms for problem solving, need for OOP, Differences between OOP and Procedure oriented programming, Advantages of OOP. Concept of Object Oriented Programming - Data hiding, Data Abstraction, Data encapsulation, Class and Object , Polymorphism , Inheritance.

Beginning with C++ : What is C++, Applications of C++ , Structure of C++ Program , C++ character set, Tokens , C++ Data types, Variables, A simple C++ Program. Comparing C with C++.

### **UNIT – II**

Expressions and control structures : Operators in C++, Scope resolution operator, Member dereferencing operators, Memory Management operators, set manipulators, Expressions and implicit conversions.

Classes : Need for classes, Class definition, Class structure , Class objects, referencing Class members , scope of class and its members.

Functions in C++ : Function prototyping, Inline function, Constant member function ,Default arguments , function overloading, friend function.

### **UNIT - III**

Classes and Objects : Array of objects , Arrays within class , Object as function arguments, function returning objects , Nesting of member function , Nesting of classes , Private member function, Friendly function.

Memory Allocation : Memory allocation of objects, Static data members, Static member functions, pointers to members , New and delete Operator ,This Pointer.

### **UNIT - IV**

Constructor : Need for Constructors, Declaration and Definition , Default Constructors, Parameterized Constructors , copy Constructors, Order of constructor invocation , Dynamic initialization of Objects, Constructor overloading, Dynamic Constructors , Constructor with Default arguments , Constructing two - Dimensional Arrays , Special characteristics of Constructors.

Destructors : Need for Destructors , Declaration and Definition , Characteristics of Destructors.

## **UNIT - V**

Inheritance : Need for Inheritance , Different forms of inheritance , Derived and base classes : single Inheritance , Multiple Inheritance , Multi level Inheritance , Hierarchical Inheritance and hybrid Classes. Visibility Modes , Inheritance and Access control , Virtual Base Classes , Abstract Classes, Constructors in Multiple Inheritance.

Virtual Functions and Polymorphism : Pointers to objects, Pointers to Derived Classes , Virtual Functions , Pure Virtual Functions.

### **Recommended Book :**

- 1. Object Oriented Programming with C++ :- E. Balaguruswamy**

## **Paper-III : Computer Organization**

### **UNIT - I**

Instruction codes : Introduction , Stored program organization , Indirect address, computer registers , common bus system.

Register transfer language , register transfer, Bus and memory transfer, Three state bus buffer. Arithmetic Micro operations, Logic micro operations, Shift micro operation. Binary Adder, Binary Incrementer , Arithmetic circuits.

### **UNIT -II**

Computer instructions : Basic computer Instructions , Instruction set completeness , Timing and Control. Instruction Cycle : Fetch and Decode, Type of instructions , Register- Reference Instructions, Memory - Reference Instructions , Input-Output Instructions. Interrupt Cycle.

### **UNIT - III**

CPU : Introduction, General Register organization, control word , Example of micro operations , Stack Organization , register stack, memory stack , Instruction Formats : Three-address Instructions, Two-address Instructions , one-address Instructions, Zero-address Instructions.

Addressing modes : Implied, Immediate , Register , Register Indirect , Auto increment or Auto decrement , Direct Address , Indirect Address , Relative Address , Indexed Addressing , Base Register Addressing Mode.