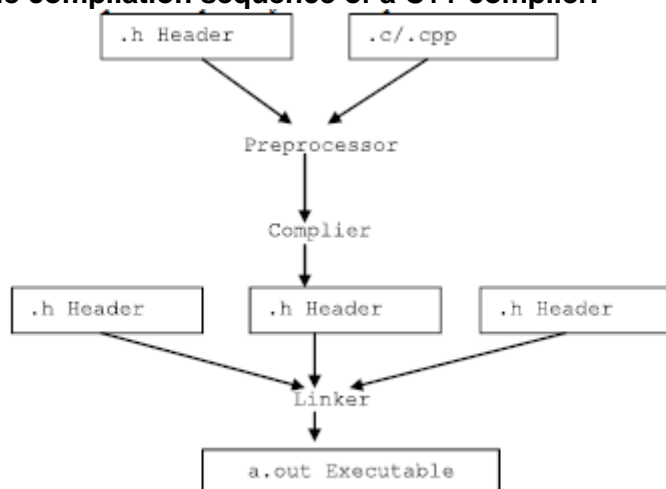# EC6301 OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

2Mark Questions with Answers

UNIT-I

DATA ABSTRACTION AND OVERLOADING

1.Draw the compilation sequence of a C++ compiler.

2.What are the concepts of OOPs.

Objects, Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding and Message passing.
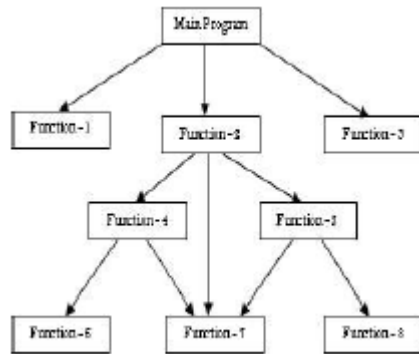
3.What are the features of OOPs.

- Emphasis is on data rather than procedure.
- Programs are divided into what are known as objects.
- Data structures are designed such that they characterize the objects.
- Functions that operate on the data of an object are tied together in the data structure.
- Data is hidden and cannot be accessed by external functions.
- Objects may communicate with each other through function.
- New data and functions can be easily added whenever necessary.
- Follows bottom up approach in program design.

4.Define Polymorphism

Polymorphism, a Greek term, means the ability to take more than one form.

Polymorphism allows the routines to use variables of different types at different times

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5.Draw the structure of POP.

6.Define Classes and Object.

Classes are data types based on which objects are created. Objects with similar properties and methods are grouped together to form a Class. Thus, a Class represents a set of individual objects. Characteristics of an object are represented in a class as Properties (Attributes). Object is the basic unit of object-oriented programming. Objects are identified by its unique name. An object represents a particular instance of a class.

7.Write the syntax for main function.

```
Int main()
{
  Count<<"Welcome to C++";
   Return 0;
}
```

8.What is a keyword?

Keywords are word whose meanings have been already defined in the c compiler. They are also called as reserved words. (ex) main(), if, else, else, if, scanf, printf, switch, for, goto, while ect.,

9.Define constant in C++

Constants in C++ refers to fixed values that do not change during execution of a program.

10.Define Variable

A quantity which may vary during execution of a program is called as a variable.

11. What are unary operators?

The operators that act upon a single operand are called as unary operators. The unary operators used in C++ are - , ++, -- and size of operators.

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12. What are binary operators?

The operators that act upon two operands are called binary operators. The binary operators used in C++ are +, -, *, /, %, =. etc.,

13. What are ternary operators?

The operators that act upon three operands are called as ternary operators. The ternary operator available in C++ is (?:).This operator is also referred as conditional operator.

14. What is meant by an expression?

An expression is a combination of constant, variable, operators and function calls written in any form as per the syntax of the C++ language.

15. Define inheritance

Inheritance

- Objects are often defined in terms of hierarchical classes with a base class and one or more levels of classes that inherit from the classes that are above it in the hierarchy.

- For instance, graphics objects might be defined as follows:

- Syntax for Inheritance

    class derivedclass : public baseclass

  {

        private :

        // Declarations of additional members, if needed.

        public:

        // Declarations of additional members, if needed.

        protected:

        // Declarations of additional members, if needed.

  }

16. State the difference between C and C++.

C	C++
Procedural programming language	Object-oriented programming language
Global variables can be declared	It is an error to declare a variable as global
Function prototypes are optional	All functions must be prototyped

17.Define encapsulation

Encapsulation is one of the most important features of a class. It is the process OS combining member functions and the data it manipulates by logically binding the data and keeping them safe from outside interference.

18. Define abstraction.

Creation of well-defined interface for an object, separate from its implementation

e.g., key functionalities (init, add, delete, count, print) which can be called independently of knowing how an object is implemented

19. Define polymorphism

Polymorphism means "having many forms". It allows different objects to respond to the same message in different ways, the response specific to the type of the object.

E.g. the message display Details() of the Person class should give different results when send to a Student object (e.g. the enrolment number).

20. List out the benefits of oops.

- Can create new programs faster because we can reuse code

- Easier to create new data types

- Easier memory management

- Programs should be less bug-prone, as it uses a stricter syntax and type checking.

- 'Data hiding', the usuage of data by one program part while other program parts cannot access the data Will whiten your teeth

21. List out the application of oops.

- Client server computing

- Simulation such as flight simulations.

- Object-oriented database applications.

- Artificial intelligence and expert system

- Computer aided design and manufacturing systems.

- Real time systems, such as process control, temperature control.

22. Define data hiding.

The purpose of the exception handling mechanism is to provide a means to detect and report an "exceptional circumstance" so that appropriate action can be taken.

23. What is the use of scope resolution operator?

In C, the global version of the variable cannot be accessed from within the inner block. C++ resolves this problem by introducing a new operator :: called the scope resolution operator. It is used to uncover a hidden variable.

Syntax:

    :: variable name

24. When will you make a function inline?

When the function definition is small, we can make that function an inline function and we can mainly go for inline function to eliminate the cost of calls to small functions.

25. What is overloading?

Overloading refers to the use of the same thing for different purposes. There are 2 types of overloading:

- Function overloading
- Operator overloading

26. What is the difference between normal function and a recursive function?

A recursive function is a function, which call it whereas a normal function does not. Recursive function can't be directly invoked by main function.

27. What are objects? How are they created?

Objects are basic run-time entities in an object-oriented programming system. The class variables are known as objects. Objects are created by using the syntax:

Classname obj1,obj2,……,objn; (or) during definition of the class:

Class classname

{

}obj1,obj2,…..,objn;

28. List some of the special properties of constructor function.

- They should be declared in the public section.
- They are invoked automatically when the objects are created.
- They do not have return types, not even void and cannot return values
- Constructors cannot be virtual. Like other C++ functions, they can have default arguments

29. Describe the importance of destructor.

A destructor destroys the objects that have been created by a constructor upon exit from the program or block to release memory space for future use. It is a member function whose name is the same as the class name but is preceded by a tilde.

Syntax:

~classname(){ }

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30. Define modular programming.

It is a process of splitting a large program in to smaller modules to perform the operations fast and, which helps in easy error checking. Modules should be designed, implemented and documented with regard to their possible future use in other projects.

31. What do you mean by friend functions?

C++ allows some common functions to be made friendly with any number of classes, thereby allowing the function to have access to the private data of these classes. Such a function need not be a member of any of these classes. Such common functions are called friend functions.

32. Mention the types of polymorphism.

The types of polymorphism are

- compile time polymorphism
- runtime polymorphism

33. What are member functions?

Functions that are declared within the class definition are referred as member function.

34. Define dynamic binding.

Dynamic binding means that the code associated with a given procedure call is not known until the time of the call at run-time. Dynamic Programming is a technique for computing recurrence relations efficiently by storing partial results.

Dynamic programming uses the following idea:

 1. Express the solution to a problem in terms of solutions to smaller problems.

 2. Solve all the smallest problems first and put their solutions in a table, then solve the next larger problems, and so on, up to the problem one originally wanted to solve.

Each problem should be easily solvable by looking up and combining solutions of Smaller problems in the table.

35.State the difference between a constructor and destructor.

Constructor	Destructor
A constructor is used to initialize the object	A destructor is used for releasing dynamically allocated memory
No symbol precedes the class name	A tilde symbol precedes the class name
Constructors can be overloaded	Destructors cannot be overloaded

36.What is the use of new operator?

The new operator is used to allocate contiguous unnamed memory during execution time and returns a pointer to the start of it.

37. What is the different between a pre-increment and post-increment operator.

A pre-increment operation such as ++a, increments the value of a by 1, before a is used for computation, while a post-increment operation such as a++, uses the current value or present value of a in the calculation and then increments the value of a by 1.

38. Distinguish between break and continue statement.

Break	Continue
Used to terminate the loops or to Used to transfer the control to the Exit loop from a switch. Start of loop	The break statement when executed The continue statement when causes Immediate termination of loop executed caused immediate containing it. Termination of the current iteration of the loop.

39. Distinguish between while and do-while loop.

While loop	do-while loop
The while loop tests the condition The do-while loop tests the condition before each iteration after the first iteration	If the condition fails initially the loop Even if the condition fails initially Is skipped entirely even in the first the loop is executed once Iteration

40. What are the C++ operators that cannot be overloaded?

- Size operator (sizeof)
- Scope resolution operator (::)
- Class member access operators(. , .*)
- Conditional operator (?:)

41. What is the use of Constructors?

A class is a special member function of a class that is executed whenever we create new objects of that class. A constructor will have exact same name as the class and it does not have any return type at all, for setting initial value for certain member variables even void. Constructors can be very useful for setting initial values for certain member variables.

42. How will you overload unary and binary operator using member function?

When overloading an operator using a member function,

- The leftmost operand of the overloaded operator must be an object of the class type.
- The leftmost operand becomes the implicit * this pointer. All other operands become function parameters.

43. What are the advantages of static data member and static functions?

The static data member informs the compiler that only one copy of the data member exit and all objects of the class should share that variable without duplicating it for each instance of the class.

44.What is the significance of contour structures?

It shows how to structure the flow of control through a program. And how statements are connected by simple but powerful control structure that have a single entry and exit point.