**DA 5**

**(OOPS)**

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Ans1) A public member is accessible from anywhere outside the class but within a program.

A private member variable or function cannot be accessed, or even viewed from outside the class. Only the class and friend functions can access private members.

A protected member variable or function is very similar to a private member but it provided one additional benefit that they can be accessed derived classes.

Ans 2) Types of inheritance-

* Single Inheritance: When a Derived Class to inherit properties and behaviour from a single Base Class, it is called as single inheritance.
* Multi Level Inheritance: A derived class is created from another derived class is called Multi Level Inheritance. Its is like a class derived from a class derived from another class.
* Hierarchical Inheritance: More than one derived class are created from a single base class, is called Hierarchical Inheritance. Basically two or more classes from a single class.
* Hybrid Inheritance : Any combination of above three inheritance (single, hierarchical and multi level) is called as hybrid inheritance.
* Multiple Inheritance: Multiple inheritances allows programmers to create classes that combine aspects of multiple classes and their corresponding hierarchies.

Ans 3)

A constructor is a member function of a class which initializes objects of a class. In C++, Constructor is automatically called when object(instance of class) create. It is special member function of the class.

An example code:

#include <iostream>

#include <string>

using namespace std;

class human{

public:

human(){

cout<<"constructor is called when u create an object of human";

}

};

int main(){

human akx;

return 0;

}

Types:

1. **Default Constructors:** Default constructor is the constructor which doesn’t take any argument. It has no parameters.
2. **Parameterized Constructors:**It is possible to pass arguments to constructors. Typically, these arguments help initialize an object when it is created.
3. **Copy Constructor:** A copy constructor is a member function which initializes an object using another object of the same class. Detailed article on Copy Constructor.

Ans 4)

Encapsulation is the method of combining the data and functions inside a class. This leads to the data getting protected and hidden from being accessed directly from outside the class. All the members of a class are **Private**by default, thus securing them and avoiding from being accessed from outside the class.

Benefits:

* Encapsulated classes reduce complexity.
* Help protect our data. An unknown user cannot change a specific data if we encapsulate it.
* Encapsulated classes are easier to modify.
* Polymorphism means having many forms or we can say we can define the polymorphism as the ability to display a message in more than one form.
* It happens when there is a hierarchy of classes and they are related by inheritance. It also means that a call to a member function will cause a different function to run.

Types:

1. **Compile time:**

The compile time polymorphism can be achieved by function overloading or by operator overloading. The overloaded functions are invoked by matching the type and number of arguments and this is done at the compile time so, compiler selects the appropriate function at the compile time. The operator overloading is also known as static binding.

1. **Function overloading:**

When there are multiple functions with same name but have different parameters then these functions are said to be overloaded. They can be overloaded by change in number of arguments or change in type of arguments.