“Inheritance”.

1. Which among the following best describes the Inheritance?
a) Copying the code already written
b) Using the code already written once
c) Using already defined functions in programming language
d) Using the data and functions into derived segment
View Answer
Answer: d
Explanation: It can only be indicated by using the data and functions that we use in derived class, being provided by parent class. Copying code is nowhere similar to this concept, also using the code already written is same as copying. Using already defined functions is not inheritance as we are not adding any of our own features.

2. How many basic types of inheritance are provided as OOP feature?
a) 4
b) 3
c) 2
d) 1
View Answer
Answer: a
Explanation: There are basically 4 types of inheritance provided in OOP, namely, single level, multilevel, multiple and hierarchical inheritance. We can add one more type as Hybrid inheritance but that is actually the combination any types of inheritance from the 4 basic ones.

3. Which among the following best defines single level inheritance?
a) A class inheriting a derived class
b) A class inheriting a base class
c) A class inheriting a nested class
d) A class which gets inherited by 2 classes
View Answer
Answer: b
Explanation: A class inheriting a base class defines single level inheritance. Inheriting an already derived class makes it multilevel inheritance. And if base class is inherited by 2 other classes, it is multiple inheritance.

4. Which among the following is correct for multiple inheritance?
a) class student{public: int marks;}s; class stream{int total;}; class topper:public

student, public stream{ };
b) class student{int marks;}; class stream{ }; class topper: public student{ };
c) class student{int marks;}; class stream:public student{ };
d) class student{ }; class stream{ }; class topper{ };
View Answer
Answer: a
Explanation: Class topper is getting derived from 2 other classes and hence it is multiple inheritance. Topper inherits class stream and class student publicly and hence can use its features. If only few classes are defined, there we are not even using inheritance (as in option class student{ }; class stream{ }; class topper{ };).

5. Which programming language doesn't support multiple inheritance?
a) C++ and Java
b) C and C++
c) Java and SmallTalk
d) Java
View Answer
Answer: d
Explanation: Java doesn't support multiple inheritance. But that feature can be implemented by using the interfaces concept. Multiple inheritance is not supported because of diamond problem and similar issues.

6. Which among the following is correct for a hierarchical inheritance?
a) Two base classes can be used to be derived into one single class
b) Two or more classes can be derived into one class
c) One base class can be derived into other two derived classes or more
d) One base class can be derived into only 2 classes
View Answer
Answer: c
Explanation: One base class can be derived into the other two derived classes or more. If only one class gets derived by only 2 other classes, it is also hierarchical inheritance, but it is not a mandatory condition, because any number of derived classes can be there.

7. Which is the correct syntax of inheritance?
a) class derived_classname : base_classname{ /*define class body*/ };
b) class base_classname : derived_classname{ /*define class body*/ };
c) class derived_classname : access base_classname{ /*define class body*/ };

d) class base_classname :access derived_classname{ /*define class body*/ };
View Answer
Answer: c
Explanation: Firstly, keyword class should come, followed by the derived class name. Colon is must followed by access in which base class has to be derived, followed by the base class name. And finally the body of class. Semicolon after the body is also must.

8. Which type of inheritance leads to diamond problem?
a) Single level
b) Multi-level
c) Multiple
d) Hierarchical
View Answer
Answer: c
Explanation: When 2 or more classes inherit the same class using multiple inheritance and then one more class inherits those two base classes, we get a diamond like structure. Here, ambiguity arises when same function gets derived into 2 base classes and finally to 3rd level class because same name functions are being inherited.

9. Which access type data gets derived as private member in derived class?
a) Private
b) Public
c) Protected
d) Protected and Private
View Answer
Answer: a
Explanation: It is a rule, that when a derived class inherits the base class in private access mode, all the members of base class gets derived as private members of the derived class.

10. If a base class is inherited in protected access mode then which among the following is true?
a) Public and Protected members of base class becomes protected members of derived class
b) Only protected members become protected members of derived class
c) Private, Protected and Public all members of base, become private of derived class
d) Only private members of base, become private of derived class
View Answer
Answer: a
Explanation: As the programming language rules apply, all the public and protected members of base class becomes protected members of derived class in protected

access mode. It can't be changed because it would hinder the security of data and may add vulnerability in the program.

11. Members which are not intended to be inherited are declared as _____
a) Public members
b) Protected members
c) Private members
d) Private or Protected members
View Answer
Answer: c
Explanation: Private access specifier is the most secure access mode. It doesn't allow members to be inherited. Even Private inheritance can only inherit protected and public members.

12. While inheriting a class, if no access mode is specified, then which among the following is true? (in C++)
a) It gets inherited publicly by default
b) It gets inherited protected by default
c) It gets inherited privately by default
d) It is not possible
View Answer
Answer: c
Explanation: If the access mode is not specified during inheritance, the class is inherited privately by default. This is to ensure the security of data and to maintain OOP features. Hence it is not mandatory to specify the access mode if we want the class to be inherited privately.

13. If a derived class object is created, which constructor is called first?
a) Base class constructor
b) Derived class constructor
c) Depends on how we call the object
d) Not possible
View Answer
Answer: a
Explanation: First the base class constructor is invoked. When we create a derived class object, the system tries to invoke its constructor but the class is derived so first the base class must be initialized, hence in turn the base class constructor is invoked before the derived class constructor.

14. The private members of the base class are visible in derived class but are not accessible directly.
a) True

b) False
View Answer
Answer: a
Explanation: Consider that a variable is private in base class and the derived class uses public inheritance to inherit that class. Now if we also have a global variable of same name as that of base class private variable, neither the global variable nor the base class private variable will be accessible from derived class. This is because we can't have 2 variables with same name in same local scope. Hence the private members are accessible but not directly.

15. How can you make the private members inheritable?
a) By making their visibility mode as public only
b) By making their visibility mode as protected only
c) By making their visibility mode as private in derived class
d) It can be done both by making the visibility mode public or protected
View Answer
Answer: d
Explanation: It is not mandatory that you have to make the visibility mode either public or protected. You can do either of those. That will give you permission to inherit the private members of base class.

"Types of Inheritance".

1. How many types of inheritance are possible in C++?
a) 2
b) 3
c) 4
d) 5
View Answer
Answer: d
Explanation: There are five types of inheritance that are possible in C++. Single level, Multilevel, multiple, hierarchical and hybrid. Here we count hybrid also because it sometimes can bring up a new form of inheritance, Like inheritance using multiple and hierarchical, which sometimes results in diamond problem.

2. Which among the following is true?
a) Java supports all types of inheritance
b) Java supports multiple inheritance
c) Java doesn't support multiple inheritance

d) Java doesn't support inheritance
View Answer
Answer: c
Explanation: Java doesn't support multiple inheritance. This is done to avoid the diamond problem that sometimes arises with inherited functions. Though, multiple inheritance can be implemented in java using interfaces.

3. Which type of inheritance is illustrated by the following code?


```
class student{ public: int marks; };
class topper: public student { public: char grade; };
class average{ public: int makrs_needed; };
class section: public average{ public: char name[10];  };
class overall: public average{  public: int students;  };
```

a) Single level
b) Multilevel and single level
c) Hierarchical
d) Hierarchical and single level
View Answer
Answer: d
Explanation: It is hierarchical inheritance and single level inheritance. Since class topper is inheriting class student, it is single level inheritance. And then average is inherited by section and overall, so it is hierarchical inheritance. But both of them are separate. Hence it is not hybrid inheritance.

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4. Which among the following best describes multiple inheritance?
a) Two classes being parent of any other classes
b) Three classes being parent of other classes
c) More than one class being parent of other child classes
d) More than one class being parent of single child
View Answer
Answer: d
Explanation: If a class inherits more than one class, it is known as multiple inheritance. This should not be referred with only two or three classes being inherited. But there must be one class which inherits more than one class to be called as multiple inheritance.

5. How many types of inheritance can be used at a time in a single program?
a) Any two types
b) Any three types
c) Any 4 types
d) Any type, any number of times
View Answer
Answer: d
Explanation: Any type of inheritance can be used in any program. There is no rule to use only few types of inheritance. Only thing that matters is how the classes are inherited and used.

6. Which type of inheritance results in the diamond problem?
a) Single level
b) Hybrid
c) Hierarchical
d) Multilevel
View Answer
Answer: b
Explanation: In diamond problem, hierarchical inheritance is used first, where two different classes inherit the same class and then in turn a 4th class inherits the two classes which had inherited the first class. Using more than one type of inheritance here, it is known as hybrid inheritance.

7. If 6 classes uses single level inheritance with pair classes (3 pairs), which inheritance will this be called?
a) Single
b) Multiple
c) Hierarchical
d) Multilevel
View Answer
Answer: a
Explanation: Here all the pairs are using single inheritance. And no different pairs are inheriting same classes. Hence it can't be called hybrid or multilevel inheritance. You can say the single inheritance is used 3 times in that program.

8. Which among the following is correct for the following code?

```
class A
{
    public : class B
    {
        public : B(int i): data(i)
```

```
        {
        }
        int data;
    }
};
class C: public A
{
     class D:public A::B{ };
};
```

a) Multi-level inheritance is used, with nested classes
b) Multiple inheritance is used, with nested classes
c) Single level inheritance is used, with enclosing classes
d) Single level inheritance is used, with both enclosing and nested classes
View Answer
Answer: d
Explanation: Class C is inheriting Class A. Class D is inheriting class B, both are nested. Hence it is single inheritance. For multiple inheritance, class C or D should have inherited both class A and class B.

9. Which among the following is false?
a) If one class inherits the inherited class in single level inheritance, it is multi-level inheritance
b) Hybrid inheritance always contains multiple inheritance
c) Hierarchical inheritance involves inheriting same class into more than one classes
d) Hybrid inheritance can involve any types of inheritance together
View Answer
Answer: b
Explanation: It is not necessary to have multiple inheritance in hybrid type. It can have any type together. This doesn't have to be of specific type always.

10. If class A has two nested classes B and C. Class D has one nested class E, and have inherited class A. If E inherits B and C, then _____
a) It shows multiple inheritance
b) It shows hierarchical inheritance
c) It shows multiple inheritance
d) Multiple inheritance among nested classes, and single level for enclosing classes
View Answer
Answer: d
Explanation: This involves the same concept of inheritance, where the nested classes also follow the inheritance rules. The Enclosing classes are having single inheritance. Nested classes involves multiple.

11. In hierarchical inheritance, all the classes involve some kind of inheritance.
a) True
b) False
View Answer
Answer: b
Explanation: This is so because few classes might not be involved in any type of inheritance in whole program whereas other classes might be participating in more than one type of inheritance at the same time.

12. Which type of inheritance cannot involve private inheritance?
a) Single level
b) Multiple
c) Hybrid
d) All types can have private inheritance
View Answer
Answer: d
Explanation: This is a common type of inheritance where the protected and public members of parent class become private members in child class. There is no type which doesn't support private inheritance.

13. How many classes can be inherited by a single class in multiple inheritance (C++)?
a) Only 2
b) Only 27
c) Only 1024
d) Any number of classes can be inherited
View Answer
Answer: d
Explanation: Any class can inherit any number of classes. There is no limit defined for the number of classes being inherited by a single class.

14. How many classes can be inherited by a single class in java?
a) Only 1
b) Only 27
c) Only 255
d) Only 1024
View Answer
Answer: a
Explanation: Since java doesn't support multiple inheritance, it is not possible for a class to inherit more than 1 class in java. This is the same case in C# also.

15. If multi-level inheritance is used, First class B inherits class A, then C inherits B and so on. Till how many classes can this go on?

a) Only till class C
b) Only till class J
c) Only till class Z
d) There is no limit
View Answer
Answer: d
Explanation: In this case, there is no limit. All the classes going on like this will inherit the members of base class, and hence the upper level inheritance won't affect the number of classes that can go on inheriting in this pattern.

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