**Objective:** To familiarize students with inheritance concepts.

**Theory:**

**Inheritance**: Process of creating new class from one or more existing class, the properties of existing class is extended to new class, the new class is called derived class and existing class is called base class

Types of Inheritance:

• Single • Multiple • Multi-level

• Hierarchical • Hybrid • Multipath

**Ambiguity**: In OOP ambiguity means duplication of members due to inheritance, In child class there will be 2 or more member with same name from inherited class.

Virtual Base Class: To avoid ambiguity we can make the common base class as virtual base class

**Container** **Class**: Class consists of object of one class in another object

**Programs:**

1. An educational institution wishes to maintain a database of its employees. The database is divided into a number of classes whose hierarchical relationship are shown below. The figure also shows minimum information requires for each class. Specify all the classes and define functions to create database and retrieve individual information when required.

|  |
| --- |
| staff |
| code  name |

|  |
| --- |
| Teacher |
| subject  publication |

|  |
| --- |
| Officer |
| Grade |

|  |
| --- |
| Typist |
| speed |

|  |
| --- |
| Casual |
| Daily  Wages |

|  |
| --- |
| Regular |
|  |

1. Implement the below given class diagram in c++. Assume necessary functions yourself.

|  |
| --- |
| Student |
| Name  Roll |

|  |
| --- |
| Test |
| Math  Eng |

|  |
| --- |
| Sport |
| Score |

|  |
| --- |
| Result |
| Total |

1. Consider a class network given below. The class master derives information from both account and admin classes which in turn derive information from the class person. Define all the four classes and write a program to create, update and display the information contained in master objects.

|  |
| --- |
| Person |
| Name  code |

|  |
| --- |
| account |
| pay |

|  |
| --- |
| admin |
| experience |

|  |
| --- |
| Master |
| Name  code  experience  pay |

1. Rewrite the above program using constructor on each class to initialize the data members.
2. Write a program that allow you to book a ticket for person and use 2 classes Person, Reservation. Class Reservation is composite class/container class.

|  |
| --- |
| Reservation |
| Rid  Rdate  Person  Name  age |