**Inheritance & Interface (15th Feb to 22nd Feb)**

1. Create person class with data members as person\_id & name. Derive two classes Student & faculty from it. The fields of Student are course name & fees paid. The fields of faculty are subject name & number of years experience. Use proper method to accept values & override display method. (Using parameterized constructor)
2. Create a class mobile containing company name, mobile number & cost and write necessary member functions for the following:
   1. Search the mobile number with given name.
   2. Search the name with given telephone number. (Use method overloading)
3. Write a program to Design a Shape as an interface with drawShape() and then Design class for Rectangle, Triangle and Hexagon which implements the interface and override method drawShape().
4. Create an abstract class Shape with methods calc\_area and calc\_volume. Derive three classes Sphere(radius) , Cone(radius, height) and Cylinder(radius, height), Box(length, breadth, height) from it. Calculate area and volume of all. (Use Method overriding).
5. Write a Java program to create a super class Vehicle having members Company and price. Derive 2 different classes LightMotorVehicle (members – mileage) and HeavyMotorVehicle (members – capacity-in-tons). Accept the information for n vehicles and display the information in appropriate form. While taking data, ask the user about the type of vehicle first
6. Define a class Employee having private members – id, name, department, salary. Define

default and parameterized constructors. Create a subclass called “Manager” with private member bonus. Define methods accept and display in both the classes. Create n objects of the Manager class and display the details of the manager having the maximum total salary (salary+bonus)

1. Write a java program to create two packages. In first package create employee class with employee number, name & salary. In second package create a class manager which is subclass of employee class having fields as department name & incentive. Create main class which will import these packages & display gross salary.

(**Optional**)

1. Define an abstract class “Staff” with members name and address. Define two sub-classes of thisclass – “FullTimeStaff” (department, salary) and “PartTimeStaff” (number-of-hours, rate-perhour). Define appropriate constructors. Create n objects which could be of either FullTimeStaff or PartTimeStaff class by asking the user’s choice. Display details of all “FullTimeStaff” objects and all “PartTimeStaff” objects.
2. Create an interface “CreditCardInterface” with methods : viewCreditAmount(), useCard(), payCredit() and increaseLimit(). Create a class SilverCardCustomer (name, cardnumber (16 digits), creditAmount – initialized to 0, creditLimit - set to 50,000 ) which implements the above interface. Inherit class GoldCardCustomer from SilverCardCustomer having the same methods but creditLimit of 1,00,000. Create an object of each class and perform operations. Display appropriate messages for success or failure of transactions. (Use method overriding)

i. useCard() method increases the creditAmount by a specific amount upto creditLimit

ii. payCredit() reduces the creditAmount by a specific amount.

iii. increaseLimit() increases the creditLimit for GoldCardCustomers (only 3 times, not more

than 5000Rs. each time)