5 Years Integrated M.Sc.(IT)/B.Sc.(IT) – Semester 2

Foundations of Object Oriented Programming

Practical No : 1	**Enrollment No:**
Practical Problems	Solve following problem.

1. Create a class to represent a bank account, including following members:

   Data Members:

   1. Account number
   2. Name of the depositor
   3. Type of account (i.e. Savings/Current)
   4. Balance amount in the account

   Member Functions:

   1. To assign initial value
   2. To deposit an amount
   3. To withdraw an amount after checking minimum balance (minimum balance is 500)
   4. To display the name and balance

2. Write a program that define class student, in which put fields like student id,name,semester and marks of minimum 5 subjects, and perform following operations:
   1. Insert values for five students through function. (Create 5 objects)
   2. Calculate percentage and grade, if student is fail in any subject then grade is F and if he/she is pass then criteria for grade is as follows:
      a. if per >=70 grade is A
      b. if per >=60 and <70 then grade is B
      c. if per >=50 and <60 then grade is C
      d. Otherwise D.
   3. Display student result in mark sheet like format.
3. Create a class called “Hotel” which contains the following:

   Private Data Members:

   1. Rno(Data member to store Room No)
   2. Name(Data member to store customer name)
   3. Tarrif(Data member to store per day charges)
   4. Days(Number of days of stay)

   Member Function:

   1. Calculate( ) // A function to calculate and return the amount
   2. Formula: days*tarrif.

   Public Members:

   1. Check-in () // A function to enter Rno, Name, tariff and days
   2. Display( ) // A function to display Rno, Name, Tarrif, days and
   3. Total amount as per the Calculate () function

   Instantiate the class and write the main function as needed.

4. Develop a C++ application for Railway Ticket Booking. Create a class Train and display the following details of train and perform the required task:
   - Train Number
   - Train Name
   - Train Source
   - Train Destination
   - Available Coach:
     1) S1 - First AC - Fair – 260 Rs.
     2) S2 - Chair Car – 180 Rs.
     3) S3 - Sleeper – 75 Rs.

   - Ask user the coach and number of seats required.
   - After taking the total number of seats, ask number of senior citizen and children under age of 5 years.
   - Do not consider any charges for children; and for senior citizen consider 50% of fair.

   Display the last payable amount.
5. Write a menu driven program that manages the functionalities of Library. Give choice to the user, to perform from following operation:
   1. Member Detail
   2. Book Detail
   3. Exit
   - Member Detail – Manages stuff related to members.
   - Book Detail – Manages stuff related to books.
   - Exit – to close application
6. Create two classes DM and DB which stores values of distances.
   DM stores distances in meters and centimeters. DB stores distances in feet and inches.

   Write a program that can read values for the class objects. Add one object of DM with another object of DB. Use friend function to carry out addition's operations. And display it result in meter and centimeter.
7. Create the classes named DATE and TIME. Create a friend function which can act as a bridge between both the classes for finding date and time.

   Make a proper method which can take seconds for finding Time and also day, month and year for finding Date.
8. Write a program by creating two classes named "Length" and "Distance" which can convert meter to kilometer using proper methods. [Take the use of friend class.]
9. Create a class called "counter" by using appropriate methods count number of objects using static data members and member function.

Objective(s)	Clear the concept of Class and Objects.

Pre-requisite	Usage of cout,cin, different looping constructs and conditional statements along with struct, class and object.
Duration for completion	4 Hours
PEO(s) to be achieved	PEO1: To provide sound foundation in the fundamentals of computer application along with analytical, problem- solving, design and communication skill for life-long learning in chosen field. PEO2: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	PO1: Proficiency in and ability to apply knowledge of computer science and application and mathematics through different equations, probability and statistics. PO2: Ability to design and develop system, component or process as well as test and maintain it.
CO(s) to be achieved	CO1: Understand the basic concepts of programming. CO2: Solve technical problems through program development life cycle.
Solution must contain	Program and output
Nature of submission	Handwritten in A4 size blank papers. Write using pencil only.
Reference for solving the problem	1. BR # 2, 3 - pg no 26 to 102
Post laboratory questions	1. Give two points of differences between structure and class 2. How one can execute the same program without creating object? 3. Which error shall be raised if we don't provide semicolon (;) at the end of class?

Objectives	Solution achieves the desire the desired objective(s)	Signature
To be able to write basic algorithms		
To be able to draw basic flowcharts		
To be able to compile, run and build basic program		
Able to work with variables and printf() and scanf() function		
To be able to perform basic arithmetic operations		