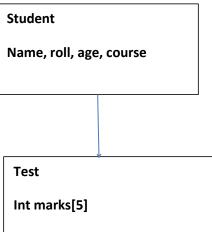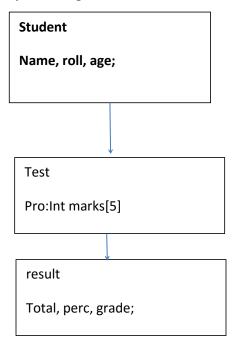# Lab-7

Topic: Inheritance with Constructors and Destructors
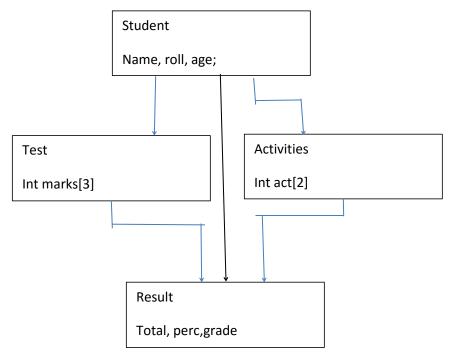
i. Create a class student which stores name, roll number and age of a student. Derive a class test from student class, which stores marks in 5 subjects. Input and display the details of a student.

Student

Name, roll, age, course

Test

Int marks[5]

ii. Extend the program i. to derive a class from result from class 'test' which includes member function to calculate total marks and percentage of a student. Input the data for a student and display his/her grade.

Student

Name, roll, age;

Test

Pro:Int marks[5]

result

Total, perc, grade;

iii.   Extend the program ii. to include a class sports, which stores the marks in sports activity. Derive the result class from the classes 'test' and 'Activities'. Calculate the total marks and percentage of a student.

```
                        ┌─────────────────────┐
                        │ Student             │
                        │                     │
                        │ Name, roll, age;    │
                        └─────────────────────┘
                           │         │     │
              ┌────────────┘         │     └──────────┐
              ▼                      │                ▼
   ┌────────────────────┐           │    ┌────────────────────┐
   │ Test               │           │    │ Activities         │
   │                    │           │    │                    │
   │ Int marks[3]       │           │    │ Int act[2]         │
   └────────────────────┘           │    └────────────────────┘
              │                      │                │
              └──────────┐          │      ┌──────────┘
                         ▼          ▼      ▼
                    ┌────────────────────┐
                    │ Result             │
                    │                    │
                    │ Total, perc,grade  │
                    └────────────────────┘
```
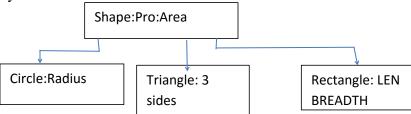
iv.   Create a class 'shape'. Derive three classes from it: Circle, Triangle and Rectangle. Include the relevant data members and functions in all the classes. Find the area of each shape and display it.

```
                  ┌──────────────────┐
                  │ Shape:Pro:Area   │
                  └──────────────────┘
                   │        │        │
         ┌─────────┘        │        └──────────┐
         ▼                  ▼                   ▼
   ┌──────────────┐  ┌──────────────┐  ┌──────────────────┐
   │ Circle:Radius│  │ Triangle: 3  │  │ Rectangle: LEN   │
   │              │  │ sides        │  │ BREADTH          │
   └──────────────┘  └──────────────┘  └──────────────────┘
```

V.

```
+------------------------------------+          +------------------------------------+
| Batsman:                           |          | Baller                             |
|                                    |          |                                    |
| Runstaken                          |          | Type: Pace/Spin                    |
|                                    |          |                                    |
| Batting avg;                       |          | No of wickets taken                |
|                                    |          |                                    |
| No of half centuries               |          | Runrate:                           |
|                                    |          |                                    |
| No of centuries                    |          | Speed                              |
|                                    |          |                                    |
| Strike rate                        |          | No of hatricks                     |
|                                    |          |                                    |
|                                    |          | Best figure                        |
+------------------------------------+          +------------------------------------+
                          |                        |
                          v                        v
                    +------------------------------------+
                    | Allrounder                         |
                    |                                    |
                    | No of man of the match:            |
                    |                                    |
                    | No of international matches        |
                    | played:                            |
                    |                                    |
                    | No of catches:                     |
                    |                                    |
                    | ICC Ranking                        |
                    |                                    |
                    | Stylish player of the match:       |
                    +------------------------------------+
```