NAME : Yuvraj Singh

SUBJECT : OOP with C++ laboratory

CLASS : BCA 2nd SEM

FACULTY : Varsha Chouhan

YEAR : 2024-25

INDEX-I

S NO	TITLE	DATE OF EXP	DATE OF SUB	SIGN
1.	Program to create bio-data	16-04-25	05-05-25	Varsha 5/5/25
2.	Program to check even or odd	16-04-25	05-05-25	
3.	Program to find largest no. among three numbers	20-04-25	05-05-25	
4.	Program to find factorial without loop.	23-04-25	05-05-25	
5.	Create employee class with name and salary	23-04-25	05-05-25	
6.	Program to display name and its length	26-04-25	05-05-25	
7.	Create time class, perform addition.	26-04-25	05-05-25	
8.	Create shape class and calculate area.	28-04-25	05-05-25	
9.	Create student marksheet with else if	30-04-25	05-05-25	
10.	Program to make patterns	30-04-25	05-05-25	
11.	Create point class and swap values.	04-05-25	05-05-25	Varsha 5/5/25

NAME : Yuvraj Singh

SUBJECT : OOP with C++ laboratory

CLASS : BCA 2nd SEM

FACULTY : Varsha Chouhan

YEAR : 2024-25

INDEX

II

S NO	TITLE	DATE OF EXP	DATE OF SUB	SIGN
1.	C++ program to implement swap values to another variable using swap function.	06-09-25	22-05-25	Chouhan 22/5/25
2.	Program to create function with multiple parameters	08-09-25	22-05-25	
3.	Program to create function with default parameter	09-05-25	22-05-25	
4.	Program to implement inbuilt fn	11-05-25	22-05-25	
5.	Program to implement fn overloading	12-05-25	22-05-25	
6.	Program to perform inline fn	13-05-25	22-05-25	
7.	Program to perform single inheritance	15-05-25	22-05-25	
8.	Program to perform multilevel inheritance	17-05-25	22-05-25	
9.	Program to implement Ambiguity problem in multiple inheritance	19-05-25	22-05-25	
10.	Program to implement Hierarchical inheritance	20-05-25	22-05-25	
11.	Program to implement hybrid inheritance.	21-05-25	22-05-25	Chouhan 22/5/25

NAME : Yuvraj Singh	**SUBJECT :** OPP With C++
CLASS : BCA 2nd SEM	**FACULTY :** Varsha Chouhan
YEAR : 2024-25	

INDEX - (1)st

S NO	TITLE	DATE OF EXP	DATE OF SUB	SIGN
①	WAP to perform (-) operator overloading (i) Using member function (ii) Using friend function	—		
②	WAP to perform binary (+) operator overloading (i) using member fn. (ii) using friend function.	—		
③	Write a c++ program to implement a friend function.	—		
④	WAP to implement virtual function	—		
⑤	WAP to implement this pointer	—		
⑥	WAP to find length of string using pointer	—		
⑦	WAP that reads text file & write in text file	—		
⑧	WAP containing and exception use try and catch to handle the exception.	—		
⑨	WAP to create a function template to find max of two numbers that can accept int, float & double.	—		

fill dates here!

Q.1 Write a C++ program to create a biodata

```
#include <iostream>
#include <cstring>
using namespace std;
int main()
{
    string name, age, gender, phone, dob, email,
    qual;

  cout << " Enter name";
    cin>> name;

  cout << " Enter age ";
    cin>> age;

  cout << " Enter date of birth (dd/mm/yy);
  cin>> dob;

  cout << " Enter your phone number ";
  cin>> phone;

  cout << " enter your email = ";
   cin>> email;

  cout << " Enter qualification = ";
    cin>> qual;
```

Teacher's Signature _____

```
cout << "\n ========== BIODATA ========== " << endl;
cout << "Name = " << name << endl;
cout << "age = " << age << endl;
cout << " gender = " << gendur << endl;
cout << " Date of birth = " << dob << endl;
cout << " Phone number = " << Phone << endl;
cout << " Email = " << email << endl;
cout << " qualification = " << qual << endl;
```

Output

```
Enter name = Root
Enter age = 19
Enter date of birth (dd/mm/yy) = 13/06/2006
Enter your phone number = 1245670941
Enter your email = root@gov.in
Enter qualification = 12th pass

========== BIODATA ==========
Name = Root
Age = 19
Date of birth = 13/06/2006
email = root@gov.in
qualification = 12th pass
```

Neel Kamal
PAGE NO.:
DATE / /

Q. 2 Write a c++ program to check no. is even or odd

Source Code

```
#include<iostream>
using namespace std;
int main()
{
    int number;
    cout << " enter an integer = ";
    cin >> number;

if (number % 2 == 0)
{
    cout << number << " is even " << endl;
}
else {
        cout << number << " is odd " << endl;
    }
return 0;
```

Output

```
Enter an integer = 567
567 is odd.
```

Teacher's Signature

Q.3 Write a c++ program to find largest no among thre no.

Source code

```
#include <iostream>
using namespace std;

int main()
{
    int num1, num2, num3;
    cout<<" enter three number ";
    cin>> num1 >> num2 >> num3;
    int largest;

if (num1 >= num2 && num1 >= num3)
{
    largest = num1;
}
 else if (num2 >= num1 && num2 >= num3)
    {
        largest = num2;
    } else {
            largest = num3;
          }
cout<<" The largest number is = " << largest << endl;
 return 0;
}
```

Teacher's Signature _____

Output

Enter three numbers = 8
12
19
The largest number is = 19

Q.4 Write a C++ program to implement factorial no. without using loop.

Source code

```
#include <iostream>
using namespace std;
long factorial (int n)
{
    if(n<=1)
        return 1;
    else
        return n*factorial(n-1);
}
int main()
{
    int number;
    cout<<" enter an integer =";
    cin>>number;
if (number<0)
{
    cout<<" factorial not defined"<<endl;
}
```

```
else {
    cout << " Factorial of " << number << " is " <<
    factorial (number) << endl;
  }
  return 0;
}
```

Output

```
enter an integer = 12
factorial of 12 is 479001600
```

Q.5 Write an c++ program to create simple class employee with name & salary.

```
#include < iostream>
# include < string >
 using namespace std;

class employee {
        private :
                string name;
                double salary;
        public :
                void setdetails()
        {
            cout << " enter name = ";
            cin>> name;
```

Output

```
Enter your name = Root
your name is = Root
length of your name = 4
```

Q.7 Write a program to create a time class. Perform the addition of time in hour and minute form.

Source code

```
#include <iostream>
using namespace std;

class time {
  public:
        int hour, min, addhour, admin;
  void input(){
        cout << " Enter current time in hours = ";
        cin >> hours;
  cout << " Enter the current time in minutes = ";
    cin >> min;
  cout << " Enter time to add in hours = ";
   cin >> addhour;
    cout << " Enter time to add in minutes = ";
     cin >> addmin;
  }
```

```
void calculation()
{
    min=(hour * 60) + (addhour * 60) +
        (min + addmin);

    hour = min/60;
    min = min % 60;
    cout << " Time = H:M" << endl;
    cout <<" It" << hours << " :" << min;
  }
};
  int main()
  {
      time addition;
      addition.input();
      addition.calculation();
    return 0;
  }
```

Output:

```
Enter current time in hours = 2
Enter current time in minutes = 45
Enter time to add in hours = 5
Enter time to add in minutes = 25

    time = H:M
           8:13
```

Teacher's Signature _____

```
cout<<" enter salary";
cin>> salary;
}
  void display()
  {
      cout <<" Employee Name =" << name << endl;
      cout <<" employee salary =" << salary << endl;
  }
};
    int main() {
        employee emp;
        emp.setdetails();
        emp.display();
      return 0;
    }
```

Output:

```
enter name = Root
Enter salary= 21200

employee name = Root
Employee salary= 21200
```

Neel Kamal
PAGE NO.:
DATE / /

Q.6 Write a program to read your name & display the name & its length.

```
#include <iostream>
using namespace std;

class length {
        private :
                string name ;
        public :
         void read ()
         {
           cout << " Enter your name = " ;
           cin >> name ;
         }
void display ()
 {
    cout << " your name is " << name << endl ;
    cout << " length of your name = " << name.length ()
  }
};

int main() {
   length lm ;
   lm.read ();
   len.display();
   return 0;  }
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

Q.8 Write a program to create shape class & add triangle(); rectangle() and circle function calculate area of all shapes in their functions.

```
#include<iostream>
using namespace std;

class area{
    public:
        void triangle()
        {
            int height, base;
    cout<<" enter base =";
    cin>> base;
    cout<<" enter height";
    cin>> height;
    area = 1/2 * base * heigth;   // 0.5 in place of 1/2

    cout<<" area of triangle is" << area << endl;
}
  void rectangle()
  {
     int length, width;
     cout<<" enter length";
     cin>> length;
     cout<<" enter width";
     cin>> width;
```

Teacher's Signature _____

```
area = length * width;
 cout << " area of rectangle is = " << area <<
       endl;
 }
};        void circle()
          {
             int radius;
        cout << " enter radius";
        cin >> radius;

  area = 3.14 * radius * radius;
 cout << " area of circle is = " << area << endl;
 }
};
 int main()
 {
    area shapes;
    shapes.triangle();
    shapes.rectangle();
    shapes.circle();
}
 return 0;
}
```

Teacher's Signature _____

Output

```
Enter base = 5
Enter height = 6
Area of triangle is = 15

Enter length = 12
Enter width = 8

Area of rectangle is = 96
Enter radius = 7
area of circle is = 153.938
```

Q.9 Write a program to implement a point class having P(x,y). perform swap the value of two point object.

Source code

```
#include <iostream>
using namespace std;
class swapping
{
    public :
     int x,y;
```

```
void getdata()
{
    cout << " Enter 1st Value :- ";
    cin >> x;
    cout << " Enter 2nd value :- ";
     cin >> y;
}
    void process()
{
        x = x+y;
        y = x-y;
        x = x-y;
       }
void display()
 {
    cout << " After swapping " << endl;
    cout << " x = " << x << endl;
    cout << " y = " << y << endl;
 }
};
  int main()
 {
        swapping num;
        num.getdata();
        num.process();
        num.display();
 }
```

Teacher's Signature _____

Output

Enter 1st Value = 65
Enter 2nd Value = 81

After swapping
x = 81
y = 65

Q.10 (i) Draw the following pattern in C++

```
*
* *
* * *
* * * *
* * * * *
```

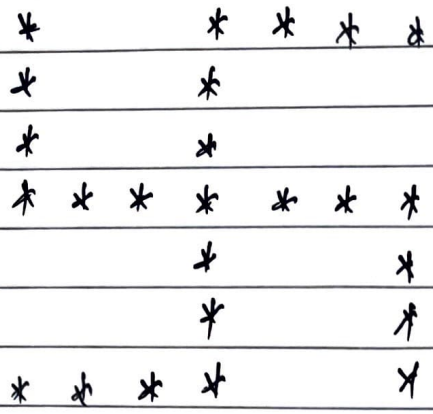
source code

```
#include <iostream>
using namespace std;
int main()
{
    int i, j;
    for (i=1; i<5; j++)
    {
        for (j=1; j<=i; j++)
        {
            cout <<"*";
        }
        Cout <<"\n";
    }
    return 0;
}
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

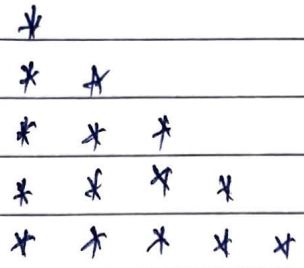
(ii)



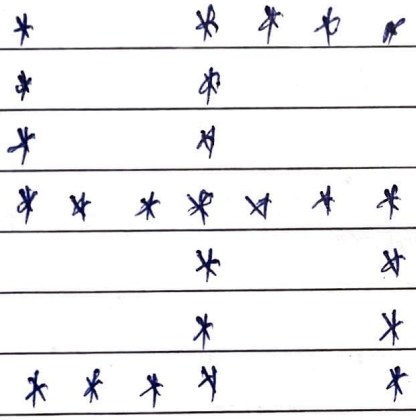
```
#include <iostream>
using namespace std;
int main()
{
    int i, j;
    for(j=0; i<=6; i++)
    {
        for(j=0; j<=6; j++)
    {
    if(i==3 && j>=0) || (i>=4 && j==6) ||
     (i>=0 && j==3) || (i==0 && j>=4) ||
     (i<=2 && j==0) || (i==6 && j<=2)
     {
        cout<<" * ";
     }
     else {
          cout<<" ";
     }
}   cout << endl;
    }
```

Teacher's Signature _____

Output



Output



Q.11 Create a student marksheet using else if laddr.

```
#include <iostream>
using namespace std;

int main()
{       string name;
        int rollno;
    float mar1, mar2, mar3, mar4, mar5;
    float total, percentage;
     char grade;
```

```
cout << "enter student name = ";
cin >> name;

cout << "enter roll no = ";
cin >> rollno;

cout << "enter marks of 5 subjects" << endl;
cin >> mar1 >> mar2 >> mar3 >> mar4 >> mar5;

total = mar1 + mar2 + mar3 + mar4 + mar5;
percentage = total / 5;

if (percentage >= 90)
    grade = 'A';
else if (percentage >= 80)
    grade = 'B';

else if (percentage >= 70)
    grade = 'C';

else if (percentage >= 60)
    grade = 'D';
elseif (percentage >= 50)
    grade = 'F';
else
    grade = 'F';
```

```
cout << "\n========= Marksheet ========" << endl;
cout << " Name = " << name << endl;
 cout << " Percentage = " << percentage << "%" << endl;
cout << " Grade = " << grade << endl;

return 0;
```

Output

```
Enter student name = Ram
Enter roll no = 1205
Enter marks of 5 subjects =
 67
 78
 90
 97
 96
========== Marksheet ========
Name = Ram
Roll No = 1205
Total marks = 428
Percentage = 85.6%.
Grade = B
```

NAME : Vaani Singh SUBJECT : DSA

Neel Kamal
PAGE NO.:
DATE / /

Assignment-2

Q.1 Write a c++ program to implement swap values to another variable using swap function.

```
#include<iostream>
using namespace std;

void swap(int x, int e)
{
        int y=x;
        x=e;
        e=y;
    cout<<" After swapping :"<<endl<<" R="<<x<<endl
    <<"E="<<e;
}
int main()
{   int a,b;
    cout<<" enter 1st number :- ";
    cin>>a;
    cout<<" enter 2nd number :- ";
    cin>>b;
    swap(a,b);
    return 0;
}
```

Output Q.1

output

```
Enter 1st number : 22
Enter 2nd number : 11

After swapping :
R = 11
E = 22
```

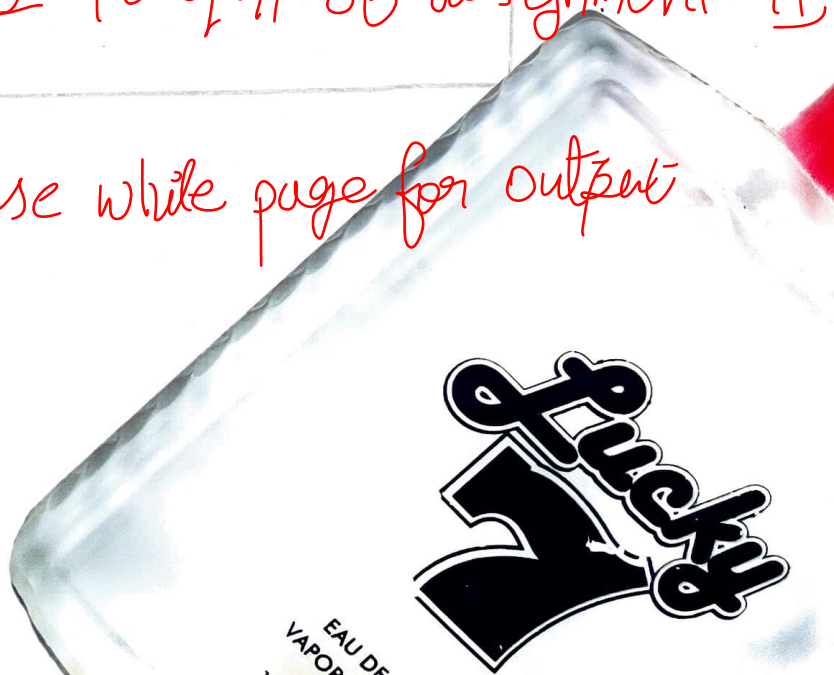
Teacher's Signature _____

Output Q2

```
Enter principal amount in RS : 10000
Enter annual interest rate in % : 12
  Enter time in years : 2
Your simple Interest is : 2400
```

→ here it is my mistake to use white page for output & writing them in left hand side you have to write question first & then output from q.2 to q.11 of assignment - II

→ & no need to use white page for output



NAME :

Neel Kamal
PAGE NO.:
DATE / / 2

Q.2 Write a c++ program to create function with multiple parameters.

Sol:

```
#include <iostream>
using namespace std;

double SI (double principal, double rate, int time)
{
    double interest = (principal * rate * time) / 100;
    return interest ;
}

int main ()
{
        double principal, rate ;
        int time ;
    cout << " enter principal amount in Rs : ";
    cin>> principal ;
    cout << endl << " enter Annual interest rate in % : ";
    cin>> rate ;
    cout << endl << " enter time in Years : ";
     cin>> time ;
// calling function
        cout <<" Your simple interest is : ";
        cout << SI (principal, rate, time);

    return 0;

}
```

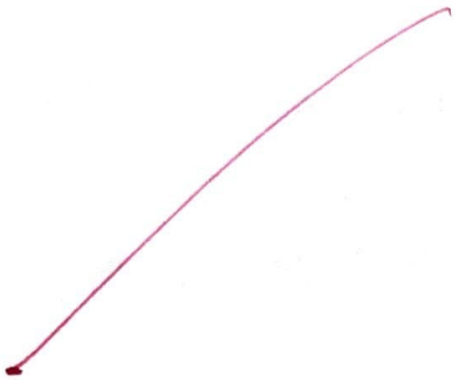
Teacher's Signature _____

Output :-

Q.3

Default Area : 50

Parameterized Area : 42



Q.3 Write a c++ program to create function with default parameter.

```
#include <iostream>
using namespace std;

int area( int width=10, int height = 5)
 {
        return width * height ;
 }

int main()
{
        // Area using default arguments

        cout << " Default Area :" << area() ;
        cout << endl;

        cout << " Parameterize area :" << area(7,6);

        return 0;

}
```

Q 4

Output :-

```
Square root of 16.0 = 4
16.0 raised to power 3 = 4096
```

NAME :-

Neel Kamal
PAGE NO.: 1
DATE / /

Q.4 Write a c++ program to implement inbuilt functions

```
#include <iostream>
#include <cmath>
using namespace std;

int main()
{
    double num1 = 16.0;
    double num2 = 3.0;

// Using inbuilt function

    double squareRoot = sqrt(num1);

    double power = pow(num1, num2);

cout << " square root of " << num1 << " = " << squareRoot
    << endl;

Cout << num1 << " raised to power " << num2 << " = "
    << power;

    return 0;

}
```

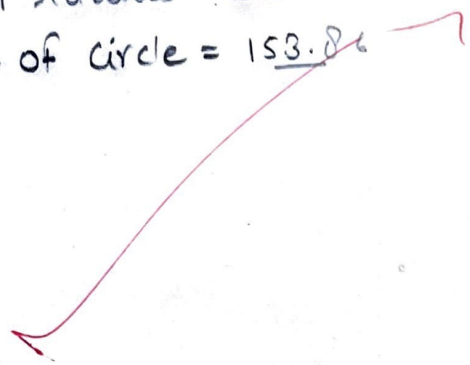
Teacher's Signature _____

Q.5

Output :-

Enter length & width of rectangle
10
5
Area of rectangle = 15

Enter radius = 7
Area of circle = 153.86



NAME : Yuvraj Singh SUBJECT : DSA

Neel Kamal
PAGE NO.: 5
DATE / /

Q.5 Write a c++ program to implement function overloading.

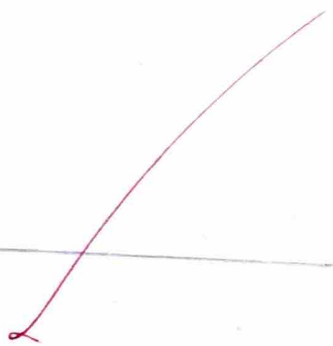
```
#include <iostream>
using namespace std;

double area(double length, double width)
{
    // Calculate area of a rectangle
    return length * width;
}

double area(double radius)
{
    double PI = 3.14;
    return PI * radius * radius;
}

int main()
{
    cout<<" Enter length & Breadth for rectangle area";
    double length, width;
    cin>> length;
    cin>> width;
    cout << "Area of rectangle =" << area(length, width);

    double radius;
    cout<<" Enter radius =";  cin>> radius;
    cout << "Area of Circle =" << area(radius);
    return 0;
}
```

Teacher's Signature _____

Q.6

Output :-

```
Cube of 5 = 125
Cube of 3.5 = 42.875
```



NAME : Y

Neel Kamal
PAGE NO.: 6
DATE / /

Q.6 Write a c++ program to perform inline function.

```
#include <iostream>
using namespace std;

inline double cube (double num)
{
    return num * num * num;
}

int main()
{
    double number = 5.0;

    double result = cube (number);
    cout << " cube of " << number << " = " <<
    result << endl;

    number = 3.5;
    result = cube (number);
    cout << " cube of " << number << " = " << result;

    return 0;
}

// inline keyword replace the function call with the
// function's code during compilation to improve performance.
```

Teacher's Signature _____

Q. 7

output :-

```
Enter two numbers :
7
8
sum = 15
```

Neel Kamal
PAGE NO.:
DATE / /

Q.7 Write a c++ program to perform single inheritance

Sol:

```
#include <iostream>
using namespace std;

// base class
class input
{       protected:
          int a,b;
          public:
            void getdata()
             {
                cout<<" enter two numbers :";
                cin>>a>>b;
};
// Derived class
class calculator : public input
{
    public:
       void add()
        {   int sum= a+b;
            cout<<" sum = " << sum << endl;
};
int main() {
          calculator calc;
          calc.getdata();
          calc.add();
          return 0;
}
```

Teacher's Signature _____

Output :-

8,8

```
Enter two numbers :
5
3
sum = 8
product = 15
```

Neel Kamal
PAGE NO.:
DATE / / 18

Q.8 Write a c++ program to perform multilevel inheritance.

```
#include<iostream>
using namespace std;

// Base class
class input {
    protected :
        int a,b;
    public :
        void getdata()
        {
            cout<<" Enter two numbers :";
            cin >> a>>b;
        }
};
// first drived class
    class calculator : public input
    {
        protected :
            int sum;
        public :
        void add()
        {
            sum = a+b;
            cout <<" sum =" << sum << endl;
        }

};
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / / 9

```
// second derived class (multilevel inheritance)

class Advancedcalculator : public calculator
{
    public :
        void multiply ()
        {
            int product = a * b;
            cout << " product = " << product << endl;
        }
};

int main ()
{
    Advancedcalculator calc;
    calc.getdata ();
    calc.multiply ();

    return 0;
}
```

Teacher's Signature _____

Output :-

Enter two numbers (from input 1) : 5 3

Enter two numbers (from input 2) : 1 4

sum (input1 :: a + input :: b) = 9

Numbers from input1 : a = 5 , b = 3

Numbers from input2 : a = 1, b = 4

Neel Kamal
PAGE NO.:
DATE / / 10

Q.9 Write a c++ program to implement Ambiguity problem in multiple inheritance.

```
#include <iostream>
using namespace std;

// first base class
class input1
{     protected:
        int a,b;
      public:
       void getdata()
       {
         cout<<" enter two numbers (from input 1) : ";
         cin>>a>>b;
       }
    void display()
    {
       cout<<" Numbers from input1 : a= "  <<a<<" ,b= "
        <<b<<endl;
    }
};
// second base class
class input2
{     protected:
        int a,b;
      public:
```

Teacher's Signature _____

```
    void getdata ()
    {
        cout << " enter two numbers (from input 2): ";
        cin >> a >> b;
    }
    void display()
    {
        cout << " Numbers from input 2 : a= " << a << ", b= "
            << b << endl;
    }
};
class calculator : public input1, public input2
  {
    public :
      void add()
      {
          int sum = input1::a + Input 2::b;
          cout << " sum (input1::a + input2::b)
                  = " << sum << endl;
      }
void showdata()
    {
        input 1 :: display();
        input 2 :: display();
    }
};
```

```
int main()
{
    calculator calc;
    calc.input1::getdata();
    calc.input2::getdata();

    calc.add();

// call showdata() to demonstrate ambiguity in display

    calc.showdata();


// Direct call to display() would cause ambiguity error
//  calc.display();

    return 0;
}
```

8.10

For Addition :

Enter two numbers : 5 3

sum = 8

For Subtraction :

Enter two numbers : 5 3

Difference = 2

Q.10 Write a C++ program to implement hierarchical inheritance.

```
#include <iostream>
using namespace std;

// Base class
 class Input
{      protected :
         int a, b;
       public :
         void getData ()
         {
              cout <<" enter two numbers : ";
              cin >> a>>b;
          }
};
 // first durived class

 class Adder : public Input
  {
       public :
         void add ()
        {      int sum = a+b;
               cout << " sum =" << sum << endl;
         }
};
```

Teacher's Signature _____

```
// second derived class
class subtractor : public Input
{
    public:
        void subtract ()
        {
            int difference = a-b;
            cout <<" Difference =" << difference <<endl;
        }
};

int main()
{
        // Create object of Adder
            Adder adder ;
            cout <<" For Addition :" << endl;
            adder.getData();
            adder.add();        // from adder class

            cout << endl;

        // Create object of subtractor
    subtractor subtracte;
        cout <<" For Subtraction :" << endl;
        subtracte.getData();

        subtracte.subtract ();
        return 0;
}
```

Teacher's Signature _____

Q 11

Roll no: 1234

Marks obtained Part 1 = 27.5

Part 2 = 33

Sports wt: 6

Total score: 66.5

NAME: Yuvraj Singh SUBJECT: DSA

Neel Kamal
PAGE NO.:
DATE / /

Q.11 Write a c++ program to implement hybrid inheritance.

```
#include<iostream>
using namespace std;

class student
{
  protected:
    int roll_no;
  public:
    void get_number(int a)
    {
      roll_no = a;
    }
  void put_number(void)
  {
    cout<<" In Roll No: "<<roll_no;
  }
};
class test: public student
{
  protected:
    float part1, part2;
  public:
    void get_marks(float x, float y)
    {
      part1 = x; part2 = y;
    }
```

Teacher's Signature _____

```
void put_marks (float x, float y)
{

    cout<<"\n Marks obtained :" <<" part 1 =" << part 1
      << "\n" <<" part 2 =" << part 2 <<"\n";
 }

};
class sports
{
      protected :
       float_score ;
        public :
          void get_score (float s)
          {
             score = s;
          }
     void put_score (void)

     {
        cout <<" sports wt :" << score <<"\n\n";
     }

};
```

NAME: Yuvraj Singh

Neel Kamal
PAGE NO.:
DATE / /

```
class result : public test, public sports
{
   float total;
   public :
   void display (void);
 };
void result :: display (void)
{
     total = part1 + part2 + score;
     put_number();
     put_marks();
     put_score();
     cout << "\n Total Score " << total;
}
int main()
{
   result stu1;
   stu1.get_number(1234);
   stu1.get_marks(27.5, 33.0);
   stu1.get_score(6.0);
   stu1.display();
   return 0;
}
```

Shaikha 22/5/25

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

Assignment - III rd

Q.1 Write a c++ program to perform unary (-) operator overloading:

(i) Using member function

```
#include<iostream>
using namespace std;
class space
{
    int x, y, z;
    public:
        void getdata(int a, int b, int c);
        void display();
        void operator-();
};

void space :: getdata(int a, int b, int c)
{
    x=a;
    y=b;
    z=c;
};

void space :: display()
{
    cout<<"x = "<<x<<" ";
    cout<<"y = "<<y<<" ";
    cout<<"z = "<<z;
};
```

Teacher's Signature _____

PAGE NO.:
DATE / /

```
void space :: operator-()
{
    x = -x;
    y = -y;
    z = -z;
};

int main()
{
    space s;
    s.getdata(10, -20, 30);
    cout << "S: ";
    s.display();

    -s;
    cout << "\n-S: ";
    s.display();
}
```

output :-

```
S:  x = 10   y = -20   z = 30
-S: x = -10  y = 20    z = -30
```

Teacher's Signature _____

NAME : Y

Neel Kamal
PAGE NO.:
DATE / /

(ii) Using friend function

```
#include <iostream>
using namespace std;

class invert_position
{
    int x, y;
    public:
        invert_position(int a, int b)
        {
            x = a;
            y = b;
        }
        void show()
        {
          cout << "x = " << x << " ";
          cout << "y = " << y << endl;
        }
        friend void operator-(invert_position &i);
};

void operator-(invert_position &i)
{
    i.x = -i.x;
    i.y = -i.y;
}
```

Teacher's Signature _____

```
int main ()
{
    invert_position i(2,3);
    i.show();
    -i;
    i.show();
}
```

Output:

```
x=2   y=3
x=-2  y=-3
```

NAME : V..... S.....

Neel Kamal
PAGE NO.:
DATE / /

Q.2 Write a c++ program to perform binary (+) operator overloading.

(i) Using member function

```
#include<iostream>
using namespace std;
class complex
{
        float x;
        float y;
        public:
        complex() { }
        Complex(float real, float imag)
        {
                x = real; y = imag;
        }
        complex operator + (complex c);
        void display();
};

complex complex:: operator + (complex C)
{
        complex demo;
        demo.x = x + c.x;
        demo.y = y + c.y;
        return(demo);
};
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

```
void complex :: display()
{
    cout << x << " + i" << y << "\n";
}

int main()
{
    complex c3;
    complex c1(2.5, 3.5);
    complex c2(1.6, 2.7);

    c3 = c1 + c2;
    cout << " c1 = ";
    c1.display();
    cout << "c2 = ";
    c2.display();
    cout << " c3 = ";
    c3.display();
}
```

Output :-

```
c1 = 2.5 + i3.5
c2 = 1.6 + i2.7
c3 = 4.1 + i6.2
```

Teacher's Signature _____

NAME : Yuvraj Singh

SUBJECT : DSA

Neel Kamal
PAGE NO.:
DATE / /

(ii) Using friend function

```
#include<iostream>
using namespace std;
class complex
{     private:  int real, imag;
      public:
      complex(int r=0, int i=0)
      {  real=r;
         imag=i;     }
      void display()
      {  cout<<real<<"+i"<<imag;
      }
      friend complex operator+(complex c1, complex c2);
};
complex operator+(complex c1, complex c2)
{           complex temp;
            temp.real=c1.real+c2.real;
            temp.imag=c1.imag+c2.imag;
            return temp;     }
int main()
{     complex c1(5,9), c2(10,5), c3;
      c1.duplay();   cout<<"+";   c2.display();
      cout<<"=";   c3=c1+c2;   c3.display();
}
```

Output:

5+i3 + 10+i5 = 15+ i8

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

Q.3 Write a c++ program to implement a friend function

```
#include<iostream>
class B;                    // forward declaration
class A
{ int n; public:   A() : n(35) { }
                   Friend int add(A, B);
};

class B
{       int n2;
        public:
          B() : n2(15)
          {
            }
        friend int add(A,B);
};
int add(A obj1, B obj2)
{    return (obj1.n + obj2.n2);
}
int main()
 {          A obj1;
            B obj2;
          std::cout<<" Sum of object is :"<< add(obj1, obj2);
 }
```

Output:-

```
Sum of object is : 50
```

Teacher's Signature _____

NAME : Yuvraj Singh

Neel Kamal
PAGE NO.:
DATE / /

Q.4 Write a c++ program to implement a virtual function

```
#include <iostream>
using namespace std;

class calculator
{
    public :
        virtual void calculate(int a, int b)
        {
        cout << " Base calculator : No calculation" << endl;
        }
};
class Adder : public calculator
{   public :
        void calculator(int a, int b)
        {
          cout << " sum : " << (a+b) << endl;
        }
};

class multiplier : public calculator
{   public:
        void calculate(int a, int b)
        {
            cout << " Product : " << (a * b) << endl;
        }
};
```

Teacher's Signature _____

```
int main()
{
    calculator base;
    calculator *ptr;

    ptr = &base;
    ptr -> calculate (5,3);

    Adder add;
    ptr = &add;
    ptr -> calculate (5,3);

    multiplier mul;
    ptr = &mul;
    ptr -> calculate (5,3);

    return 0;
}
```

Output :-

```
Base calculator : No calculation
sum : 8
Product : 15
```

Teacher's Signature _____

NAME : Yuvraj Singh SUBJECT : DSA

Neel Kamal
PAGE NO.:
DATE / /

Q.5 Write a c++ program to implement this pointer

```
#include <iostream>
using namespace std;
class test
{
    private:
        int x;
    public:
        void setx(int x)
        {
            this->x=x;
        }
    void print()
    {
        cout<<"x = "<<x<<endl;
    }
};
int main()
{
        test obj;
        obj.setx(20);
        obj.print();
}
```

Output:-

```
x = 20
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

Q.6 Write a c++ program For find a length of string using pointer.

```
#include <iostream>
using namespace std;

int main ()
{
    char str[20], *ptr;
    int i=0;
    cout<<" Pointer Example: length of string \n";
    cout<<" Enter any string (below 20 characters)";
    cin.getline (str,20);

    ptr = str;
    while (*ptr != '\0')
    {
        i++;
        ptr++;
    }
    cout<<" length of string :" <<i;
}
```

Output :-

```
Pointer example: length of string
Enter any string (below 20 character) : isOperator
length of string : 10
```

Teacher's Signature

NAME : Yuvraj Singh SUBJECT : DSA

Neel Kamal
PAGE NO.:
DATE / /

Q.7 Write a c++ program that reads text file and write in text file.

```
#include <iostream>
#include <fstream>
using namespace std;
int main()
{
    ifstream infile ("Input.txt"); // open for reading
    ofstream outfile ("output.txt"); // open for writing

    if (!infile || !outfile)
    {       cout << "file error!";
            return 1;
    }

    string line;
    while(getline(infile, line))
    {
      outfile << line << endl; // Write each line to output file
    }
    infile.close();
    outfile.close();
    cout << "File read & written successfully!";
}
```

Output:

File read and written successfully!

Teacher's Signature _____

Q.8 Write a c++ program containing an exception. use try and catch to handle the exception.

```
#include<iostream>
using namespace std;

int main()
{
    int a,b;
    cout<<"\n Enter value of A and B : ";
    cin>>a>>b;
    int x= a-b;

    try {
        if(x!=0)
        {
         cout<<"\n Result (a/x) = "<< a/x;
        }
        else {
              throw(x);
             }
         }
catch (int i)
 {
      cout<<"\n Exception Caught : Division by zero";
 }
  cout<<endl;
}
```

Teacher's Signature _____

NAME : Yuvraj Singh SUBJECT : DSA

Neel Kamal
PAGE NO.:
DATE / /

Output :-

(1) Case 1 :

```
Enter value of a and b : 20
10
Result (a/x) = 2
```

(2) Case 2 :-

```
Enter value of a and b :
20
0
Exception caught : Division by zero
```

Teacher's Signature _____

Neel Kamal
PAGE NO.:
DATE / /

Q.9 Write a c++ program to creates a function template to find maximum of two numbers that can accept int, float or double.

```
#include<iostream>
using namespace std;

template <typename T> T mymax(T x, T y)
{
    return (x>y) ? x : y;
}

int main()
{
    // call my max for int
    cout << myMax<int>(3,7) << endl;

    // call my max for double
    cout << myMax<double>(3.0, 7.0) << endl;

    // call mymax for char
    cout << myMax<char>('c', 'd');
}
```

Output :-

7
7
d

Teacher's Signature _____