LAB III

2. /* This prog. finds the diff. btwn max and min of four numbers*/

```
#include <stdio.h>
int main()
{
 double a,b,c,d;
 double max,min;

 printf("Enter four numbers: ");
 scanf("%lf%lf%lf%lf",&a,&b,&c,&d);

 max=a>b?a:b;
 min=a<b?a:b;
 if(c>d)
    {
        if(max < c)
                max=c;
        if(min > d)
                min=d;

     }
 else
    {
        if(max < d)
                max=d;

        if(min > c)
                min=c;
     }


 printf("Difference is %0.4lf\n",max-min);

 return 0;
 }
```

3. /*This prog. find value of sin(1/x)*/

```
#include <stdio.h>
#include <math.h>
int main()
{
  double x,val;
  printf("Enter value of x: ");
  scanf("%lf",&x);

  if(x!=0.0)
    {
     val = sin(1/x);
     printf("Value of sin(1/x) is %0.4lf\n",val);
    }
    else
    {
     printf("Value of x must be nonzero: try again\n");
     }

     return 0;
}
```

4.
```
/* This prog. finds the sum of digits of a +ve number less than 1000 */
#include <stdio.h>

int main()
{
  int a,s=0,q;

  printf("Enter a +ve no less than 1000: ");
  scanf("%d",&a);

  q=a;

  if(q< 1 || q > 999)
     {
      printf("Entered number is out of range\n");
     }
  else
     {
      s +=q%10;
      q /=10;
      s +=q%10;
      q /=10;
      s +=q%10;
      printf("Sum of the digits of %d is %d\n",a,s);
      }




    return 0;
}
```

5.
```
/* This prog. finds binary equiv. of a +ve decimal no. less than 32*/
#include <stdio.h>

int main()
{
  int a,q,x0,x1,x2,x3,x4;

  printf("Enter a +ve no less than 32: ");
  scanf("%d",&a);

  q=a;

  if(a< 1 || a > 31)
     {
      printf("Entered number is out of range\n");
      return 0;
     }

     x0 = q%2;
     q /= 2;
     x1=q%2;
     q /=2;
     x2=q%2;
     q /=2;
     x3=q%2;
     q /=2;
     x4=q%2;

      printf("Binary equivalent of decimal number %d  is ",a);

     if(x4 !=0)
       {
        printf("%d%d%d%d%d\n",x4,x3,x2,x1,x0);
       }
      else if(x3 !=0)
       {
        printf("%d%d%d%d\n",x3,x2,x1,x0);
       }
      else if(x2 !=0)
       {
        printf("%d%d%d\n",x2,x1,x0);
       }
      else if(x1 !=0)
       {
        printf("%d%d\n",x1,x0);
       }
       else
       {
        printf("%d\n",x0);
       }
        return 0;
   }
```

6.
```
/* This prog. finds binary equiv. of a +ve decimal frac.*/
#include <stdio.h>

int main()
{
  double a,q;
  int x1,x2,x3,x4;


  printf("Enter a +ve decimal fraction less than 1: ");
  scanf("%lf",&a);
  q=a;
  if(a<=0.0 || a >= 1.0)
    {
     printf("Entered number is not a +ve decimal fraction less than 1\n");
     return 0;
    }


         q *= 2;
         x1 = (int) q;
         q = q-x1;

         q *= 2;
         x2 = (int) q;
         q = q-x2;

         q *= 2;
         x3 = (int) q;
         q = q-x3;

         q *= 2;
         x4 = (int) q;
         q = q-x4;

            if(q !=0)
              {
                printf("Binary equivalent of %lf is 0.%d%d%d%d...\n",a,x1,x2,x3,x4);
              }
            else if(x4 !=0)
              {
                printf("Binary equivalent of %lf is 0.%d%d%d%d\n",a,x1,x2,x3,x4);
              }
            else if(x3 !=0)
             {
               printf("Binary equivalent of %lf is 0.%d%d%d\n",a,x1,x2,x3);
              }
            else if(x2 !=0)
             {
               printf("Binary equivalent of %lf is 0.%d%d\n",a,x1,x2);
              }
            else
             {
               printf("Binary equivalent of %lf is 0.%d\n",a,x1);
             }




    return 0;
}
```

7.
```
/* This prog. finds distance between two points*/
#include <stdio.h>
#include <math.h>
int main()
{
 double Ax,Ay,Bx,By,Px,Py,d;
 printf("Enter coordinates of points A: ");
 scanf("%lf%lf",&Ax,&Ay);
 printf("Enter coordinates of points B: ");
 scanf("%lf%lf",&Bx,&By);

 d=sqrt((Ax-Bx)*(Ax-Bx)+(Ay-By)*(Ay-By));

 Px=0.5*(Ax+Bx);
 Py=0.5*(Ay+By);

 printf("Distance between A and B is %0.2lf\n",d);
 printf("The coordinates of midpoint  of A and B are (%0.2lf,%0.2lf)\n",Px,Py);

 return 0;
}
```

8.

```
/* This prog. finds roots of ax^2+bx+c=0*/
#include <stdio.h>
#include <math.h>
int main()
{
 double a,b,c,d,r1,r2;
 printf("Enter a,b,c: ");
 scanf("%lf%lf%lf",&a,&b,&c);

if(a==0.0 && b==0.0)
{
printf("No solution: a & b both zero\n");
return 0;
}

if(a==0)
{
printf("Linear equation: root=%0.3lf\n",-c/b);
return 0;
}

d=b*b-4*a*c;
if(d>=0.0)
{
r1 = (-b+sqrt(d))/(2*a);
r2 = (-b-sqrt(d))/(2*a);
printf("The roots are real: %0.3lf  and %0.3lf\n",r1,r2);
}
else
{
r1 = -b/(2*a);
r2 = sqrt(-d)/(2*a);
printf("The roots are complex: %0.3lf+%0.3lf i and %0.3lf-%0.3lf i\n",r1,r2,r1,r2);
}

return 0;
}
```