

Sl no	QUESTIONS
1.	<p><b>To compute all the roots of a quadratic equation by accepting the non-zero coefficients. Print appropriate messages</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() {     float a,b,c,d,r1,r2;     system("clear");     printf("enter values of a,b and c of the quadratic equation : \n ax^2+bx+c=0\n");     scanf("%f %f %f",&amp;a,&amp;b,&amp;c);     d=((b*b)-(4*a*c));     if(a==0  b==0  c==0)         printf("invalid!!!!!!\n");     else if(d&lt;0)         printf("roots are imaginery\n");     else if(d&gt;0)     {         r1=(-b)+sqrt(d)/(2*a);         r2=(-b)-sqrt(d)/(2*a);         printf("roots are real and distinct\n root 1=%f\n root 2=%f\n",r1,r2);     }     else     {         r1=(-b)/(2*a);         r2=(-b)/(2*a);         printf("roots are real and equal\n root 1=%f\n root 2=%f\n",r1,r2);     } } </pre>
2.	<p><b>(a) To simulates a Simple Calculator to perform the basic Arithmetic Operations (Consider the operators +, -, x, / and % using ‘switch’ statement)</b></p> <p><b>(b) To check whether a given alphebet is Vowel or Consonant using ‘switch’ statement.</b></p> <pre> (a) #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; void main() {     int s,d,p,m,a,b,choice;     float q; </pre>

```

system("clear");
printf("select choice\n1.addition\n2.subtraction\n3.multiplication\n4.modulus\n5.division\n");
scanf("%d",&choice);
printf("enter two numbers:\n");
scanf("%d %d",&a,&b);
switch(choice)
{
    case 1:
        s=a+b;
        printf("sum=%d\n",s);
        break;
    case 2:
        d=a-b;
        printf("difference=%d\n",d);
        break;
    case 3:
        p=a*b;
        printf("product=%d\n",p);
        break;
    case 4:
        m=a%b;
        printf("remainder=%d\n",m);
        break;
    case 5:
        if(b!=0)
        {q=a/b;
        printf("quotient=%f\n",q);
        break;
        }
    else
    {printf("invalid\n");
    break;}
    default:
        printf("wrong choice\n");
        break;
}
}

```

(b) #include<stdio.h>

#include<stdlib.h>

```

void main()
{
    char c;
    system("clear")
    printf("enter a character:\n");
    scanf("%c",&c);
    switch(c)
    {
        case 'A':
        case 'e':
        case 'a':
        case 'i':
        case 'I':
        case 'o':
        case 'u':
        case 'U':
        case 'E':
        case 'O':
        printf("the letter is vowel\n");
        break;
        default:
        printf("letter is consonant\n");
        break;
    }
}

```

3.

**To generate an electricity bill by accepting meter number of the consumer, number of units consumed and print out the detail charges for the below scenario:**

**An electricity board charges the following rates for the use of electricity:**

- **for the first 200 units 80 paise per unit**
- **for the next 100 units 90 paise per unit**
- **beyond 300 units Rs 1 per unit**

**All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs. 400, then an additional surcharge of 15% of total amount is charged.**

```

#include<stdio.h>
#include<stdlib.h>
#include<math.h>
void main()

```

```

{
    int meter_number,consumed;
    float charge,surcharge;
    system("clear");
    printf("enter the meter number:\n");
    scanf("%d",&meter_number);
    printf("enter units consumed\n");
    scanf("%d",&consumed);
    if(consumed<=200)
    { charge=100+consumed*0.80;}
    else if(consumed<=300)
    { charge=100+(200*0.80)+(consumed-200)*0.90;}
    else
    { charge=100+(200*0.80)+(100*0.90)+(consumed-300)*1;}
    if(charge>400)
    { surcharge=charge*0.15;
      charge=charge+(surcharge);}
    else
    { surcharge=0;
      charge=charge+(surcharge);}
    printf("meter number = %d\n surcharges if any = %f\n total amount = %f\n",
meter_number,surcharge,charge);
}

```

4. **To find the sum of individual digits of a positive integer number reducing into single digit.**

```

#include<stdio.h>
#include<stdlib.h>
#include<math.h>
void main()
{
    int n,d=0,s=0;
    system("clear");
    printf("enter the number:\n");
    scanf("%d",&n);
    START:
    while(n>0)
    { d=n%10;
      s=s+d;
      n=n/10;}
}

```

	<pre> if(s&gt;9)  {n=s;  s=0;  goto START;}  printf("sum of the digits is %d\n",s);}</pre>
5.	<p><b>To generate and print the first ‘N’ Fibonacci numbers such that <math>F_n = F_{(n-1)} + F_{(n-2)}</math> where <math>n &gt; 2</math>.</b></p> <p><b>A Fibonacci sequence is defined as “the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence”.</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() {     int n,f=0,a=0,b=1,i;     system("clear");     printf("enter the number of terms\n");     scanf("%d",&amp;n);     printf("fibonacci series\n %d\n %d\n",a,b);     for(i=0;i&lt;n-2;i++)     {f=a+b;     a=b;     b=f;     printf("%d\n",f);     } }</pre>
6.	<p><b>To generate and print all the prime numbers between range N1 and N2, where ‘N1’ and ‘N2’ are value supplied by the user.</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() {     int n1,n2,n,i,f;     sytem("clear");     printf("enter the range to print the prime numbers\n");</pre>

	<pre> scanf("%d %d",&amp;n1,&amp;n2);  printf("prime numbers between %d and %d are:\n",n1,n2);  for(n=n1;n&lt;=n2;n++) { f=0; for(i=2;i&lt;=n/2;i++) { if(n%i==0) { f=1; break; } } if(f==0) printf("%d\n",n); } </pre>
7.	<p><b>To find the value of cos(x) using the series, <math>1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \dots</math> up to N terms accuracy (With and without using in-built function).</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() { int n,i,x1; float t,y,x,c; system("clear"); printf("enter the value of x in degrees\n"); scanf("%d",&amp;x1); printf("enter the number of terms(accuracy) \n"); scanf("%d",&amp;n); x=(3.14/180)*x1; i=1; c=1; t=1; while(i&lt;=n) {  t=(-t*x*x)/(2*i*(2*i-1));  c=c+t;  i=i+1; }  printf("sum of the cos(%d) series without using library function is %f\n",x1,c); </pre>

	<pre>printf("sum of the cos(%d) series using library function is %f\n ",x1,cos(x)); }</pre>
8.	<p><b>To reverse a given four-digit integer number and check whether it is a palindrome or not. Output the given number with suitable message.</b></p> <pre>#include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() {     int n,n1,r,d=0;     system("clear");     printf("enter the number\n");     scanf("%d",&amp;n);     if(n&lt;0)         n=-n;     n1=n;     while(n&gt;0)     {         r=n%10;         d=d*10+r;         n=n/10;     }     if(d==n1)         printf("the number is a palindrome\n");     else         printf("the number is not a palindrome\n"); }</pre>
9.	<p><b>To input N integer numbers into a single dimension array, sort them in to ascending order using BUBBLE SORT technique, and then to print both the given array and the sorted array with suitable headings.</b></p> <pre>#include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() {     int n,a[100],i,j,t;     system("clear");     printf("enter the number of terms\n");     scanf("%d",&amp;n);</pre>

	<pre> printf("enter the elements in the array\n"); for(i=0;i&lt;n;i++) scanf("%d",&amp;a[i]); printf("entered array is\n"); for(i=0;i&lt;n;i++) printf("%d\n",a[i]); for(i=0;i&lt;n-1;i++) { for(j=0;j&lt;n-i-1;j++) { if(a[j]&gt;a[j+1]) { t=a[j]; a[j]=a[j+1]; a[j+1]=t; } } } printf("sorted list in ascending order is\n"); for(i=0;i&lt;n;i++) printf("%d\n",a[i]); } </pre>
10.	<p><b>To input N integer numbers in ascending order into a single dimension array, and then to perform BINARY SEARCH for a given Key integer number and report success or failure in the form of a suitable message.</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() { int f,l,m,s,n,a[100],i,j,t; system("clear"); printf("enter the number of terms\n"); scanf("%d",&amp;n); printf("enter the elements in the array\n"); for(i=0;i&lt;n;i++) scanf("%d",&amp;a[i]); for(i=0;i&lt;n-1;i++) </pre>



```

{
    for(j=0;j<n-i-1;j++)
    {
        if(a[j]>a[j+1])
        {
            t=a[j];
            a[j]=a[j+1];
            a[j+1]=t;
        }
    }
}

printf("sorted list is.....\n");
for(i=0;i<n;i++)
printf("%d\n",a[i]);

f=0;
l=n-1;
m=(f+l)/2;
printf("enter the element to be searched\n");
scanf("%d",&s);
while(f<=l)
{
    if(a[m]<s)
        f=m+1;
    else if(a[m]==s)
        {printf("%d found at the location %d\n",s,m+1);
        break;}
    else
        l=m-1;
    m=(f+l)/2;
}
if(f>l)
printf("not found!!!!");
}

```

11. **To perform addition and subtraction of two matrices after checking their compatibility and print both input & output matrices with suitable headings.**

```

#include<stdio.h>
#include<stdlib.h>

```

```

#include<math.h>

void main()

{
    int a[100][100],b[100][100],s[100][100],d[100][100],i,j,r,c;
    system("clear");
    printf("enter the order of the matrices\n");
    scanf("%d %d",&r,&c);
    printf("enter the elements of matrix 1\n");
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { scanf("%d",&a[i][j]);} }
    printf("entered matrix 1 is\n");
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { printf("%3d",a[i][j]);}
      printf("\n");
    }

    printf("enter the elements of matrix 2\n");
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { scanf("%d",&b[i][j]);} }
    printf("entered matrix 2 is\n");
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { printf("%3d",b[i][j]);}
      printf("\n");
    }

    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { s[i][j]=a[i][j]+b[i][j];} }
    printf("sum of the matrices is1\n");
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)
      { printf("%3d",s[i][j]);}
      printf("\n");
    }
    for(i=0;i<r;i++)
    { for(j=0;j<c;j++)

```

	<pre> {d[i][j]=a[i][j]-b[i][j];} printf("difference of the matrices is1\n"); for(i=0;i&lt;r;i++) {for(j=0;j&lt;c;j++) {printf("%3d",d[i][j]);} printf("\n"); } } </pre>
12.	<p><b>To find the trace and norm of a given matrix A (M x N) by checking the compatibility and print both input &amp; output matrices with suitable headings. Use user-defined functions to find their trace and norm.</b></p> <pre> #include&lt;stdio.h&gt; #include&lt;stdlib.h&gt; #include&lt;math.h&gt; void main() { int a[100][100],t=0,i,j,r,c,p,s=0; float n; system("clear"); printf("enter the order of the matrices\n"); scanf("%d %d",&amp;r,&amp;c); printf("enter the elements of matrix \n"); for(i=0;i&lt;r;i++) {for(j=0;j&lt;c;j++) {scanf("%d",&amp;a[i][j]);}} printf("entered matrix is\n"); for(i=0;i&lt;r;i++) {for(j=0;j&lt;c;j++) {printf("%3d",a[i][j]);} printf("\n"); } for(i=0;i&lt;r;i++) {for(j=0;j&lt;c;j++) {p=a[i][j]*a[i][j]; s=s+p;} } n=sqrt(s); printf("normal of the matrix is %f\n",n); </pre>

```
for(i=0;i<r;i++)  
t=t+a[i][i];  
printf("trace of the given matrix is %d",t);  
}
```