Part 1:

Write a C++ program to input elements of one dimensional array with size n and define functions to do the following:

1- Print array elements.

2- Calculate the sum of array elements.

3- Calculate the mean.

4- Calculate the variance.

5- Calculate the standard deviation.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void printout(float A[],int size);
float sum(float A[],int size);
float mean(float A[],int size);
float variance(float A[],int size);
float stddev(float A[],int size);

void main()
{
  const int n=10;
  float M[n];
  int i;
  for (i=0;i<n;i++)
  {
   printf("\n Matrix[%d] = ",i+1);
   scanf("%f",&M[i]);
  }
  printout(M,n);
  printf("\n the sum of the matrix elements = %6.3f", sum(M,n));
  printf("\n the mean of the matrix elements = %6.3f", mean(M,n));
  printf("\n the variance of the matrix elements = %6.3f", variance(M,n));
  printf("\n the standard deviation of the matrix elements = %6.3f", stddev(M,n));
  getch();
}

void printout(float A[],int size)
{
  int i;
  for(i=0;i<size;i++)
    printf("\n %6.2f",A[i]);
  return;
}

float sum(float A[],int size)
{
  int i;
  float s=0.0;
```

```
  for(i=0;i<size;i++)
     s+= A[i];
  return s;
}

float mean(float A[],int size)
{
  float m;
  m = sum(A,size)/size;
  return m;
}

float variance(float A[],int size)
{
  int i;
  float s1=0.0,s2=0.0,m1,m2,v;
  for(i=0;i<size;i++)
  {
   s1+= A[i];
   s2+= pow(A[i],2);
  }
  m1=s1/size;
  m2=s2/size;
  v = m2 - m1*m1;
  return v;
}

float stddev(float A[],int size)
{
  float st;
  st = sqrt(variance(A,size));
  return st;
}
```

Part 2:
Write a C++ program to input element of two 3x3 arrays and compute their sum.

```
#include<stdio.h>
#include<conio.h>
void main()
{
const int n = 3;
int i, j;
int A[n][n], B[n][n], C[n][n];
for(i=0;i<n;i++)
{
```

```c
printf("\n row%2d:\n enter %d integers ",i+1,n);
for(j=0;j<n;j++)
scanf("%d",&A[i][j]);
}
printf("\n-------------------------------");
for(i=0;i<n;i++)
{
printf("\n row%2d:\n enter %d integers ",i+1,n);
for(j=0;j<n;j++)
scanf("%d",&B[i][j]);
}
for(i=0;i<n;i++)
for(j=0;j<n;j++)
C[i][j] = A[i][j]+B[i][j];
printf("\n Sum matrix: ");
for(i=0;i<n;i++)
{
printf("\n");
for(j=0;j<n;j++)
printf(" %3d",C[i][j]);
}
getch();
}
```

Write C++ program to input matrix A (2x3) and matrix B (3x4) and compute matrix C = A*B.

```cpp
#include<iostream>
#include<conio.h>
int main()
{
const int m = 2;
const int p = 3;
const int n = 4;
int i, j, k;
int A[m][p], B[p][n], C[m][n];
for(i=0;i<m;i++)
{
cout<<"\n row"<<(i+1)<< ":\n enter "<<p<<" integers ";
for(j=0;j<p;j++)
cin>>A[i][j];
}
cout<<"\n-------------------------------";
for(i=0;i<p;i++)
```

```cpp
{
cout<<"\n row"<<(i+1)<<":\n enter "<<n<<" integers ";
for(j=0;j<n;j++)
cin>>B[i][j];
}
for(i=0;i<m;i++)
for(j=0;j<n;j++)
{
C[i][j] = 0;
for(k=0;k<p;k++)
C[i][j] += A[i][k]*B[k][j];
}
cout<<"\n Product matrix: ";
for(i=0;i<m;i++)
{
cout<<"\n\n";
for(j=0;j<n;j++)
cout<<C[i][j]<<" ";
}
getch();
return 0;
}
```

Part 3:

Q1 – Write a program that ask you to enter, using *scanf()* your name, section and average then display it to the screen using *printf()* function.

```c
#include<stdio.h>

int main()

{

  char *name;

  int section;

  float avg;

  printf("\n Enter your name: ");        scanf(&name);

  printf("\n Enter your section: ");      scanf(&section);

  printf("\n Enter your average: ");       scanf(&avg);

  printf("\n name: %s", name);

  printf("\n section: %d", section);
```

```c
  printf("\n average: %f", avg);
return 0;

}
```

Q2 – Write the following segment using switch-case

```c
    if (op == 'a')    printf(" = %f", num1+num2);
    else if (op == 'b')    printf(" = %f", num1-num2);
    else if (op == 'c')    printf(" = %f", num1*num2);
    else if (op == 'd')    printf(" = %f", num1/ num2);
    printf("\n\n");

    switch(op)
    {
       case 'a':    printf(" = %f", num1+num2);   break;
       case 'b':    printf(" = %f", num1-num2);    break;
       case 'c':    printf(" = %f", num1*num2);    break;
       case 'd':    printf(" = %f", num1/num2);
    }
    printf("\n\n");
```

Q3 – What are the values of X1, X2, X3, X4 in the following statements:

int i=3,j=1,k=2, x1, x2, x3, x4;

x1 = i+2*j – 22/k;   3+2-11 = -6

x2 = -1+j;   -1+1 = 0

x3 = 1+ -j;   error   1+ (-j)

x4 = +i+j;   error

Q5 – What is the output of the following statement:

int a=3, b=2, c=1, x=5, y=4;

a+= b += c *= x+y-6;

```
printf("%d %d %d %d %d \n",a,b,c,x,y);          8 5 3 5 4
```

c = 1 * (5+4-6) = 3

b = 2 + 3 = 5

a = 3 + 5 = 8

Q6 – Write a program using conditional ternary operator (?) to find the absolute value of x.

```
int main()

{

  int x,abs;

  cout<<" \n x = ";      cin>>x;

  abs = (x>=0)? x: -x;

  cout << abs;

}
```

Part 4:
Q1- Write a C++ program to enter an integer and determine if it is positive, negative or zero.
```
int main ()
{
int num;
cout<<'\nEnter an integer: ";
cin>>num;
if (num>0)
cout<<"positive";
else if(num>0)
cout<<"negative";
else
cout<<"zero";
return 0;
}
```

Q2- Write a C++ program to printout multiples of 5 from 5 to 80
```
#include<iostream>
#include<conio.h>
int main( )
{
int i;
i=5;
while(i <= 80)
```

```
{
cout<< i<<endl;
i += 5;
}
getch();
return 0;
}
int main( )
{
int i;
for(i=5;i<=80;i+=5)
cout<< i<<endl;
getch();
return 0;
}
```

Q3- Write a C++ program to read the user's age and print a message "you are a child" if age is less than 18, "you are an adult" if age is more than or equal 18 and less than 65 or "you are a senior citizen" if age is more than or equal 65.

```
#include<iostream>
#include<conio.h>
int main()
{
int age;
cout<<"\n Please enter your age: ";
cin>>age;
if (age<18)
cout<<"\n You are a child";
else if ((age>=18)&&(age<65))
cout<<"\n You are an adult";
else
cout<<"\n You are a senior citizen";
getch();
return 0;
}
```

Q4- Write the following for statement into while and do-while statements:
```
For(int i=20;i>10;i--)
cout<<i*i;
```
int i = 20;
while (i>10)
{
cout<<i*i;
i--;
}
int i = 20;
do
{
cout<<i*i;
i--;
}
while (i>10)