Lab. (3)
Pointers and References

Answer the following questions

1) Printing Variable Addresses for three variables in C++

```
#include <iostream.h>
int main()
{
    // declare variables
    int var1 = 3;
    int var2 = 24;
    int var3 = 17;

    // print address of var1
    cout << "Address of var1: "<< &var1 << endl;

    // print address of var2
    cout << "Address of var2: " << &var2 << endl;

    // print address of var3
    cout << "Address of var3: " << &var3 << endl;
}
```

2) C++ Program to insert and display data entered by using pointer notation

```
#include <iostream.h>
int main() {
    float arr[5];
   // Insert data using pointer notation
    cout << "Enter 5 numbers: ";
    for (int i = 0; i < 5; ++i) {
        // store input number in arr[i]
        cin >> *(arr + i) ;
    }
    // Display data using pointer notation
    cout << "Displaying data: " << endl;
    for (int i = 0; i < 5; ++i) {
        // display value of arr[i]
        cout << *(arr + i) << endl ;
    }
    return 0;
}
```

3) Write a C++ program to accept five integer values from keyword.

The five values will be stored in an array using a pointer. Then print the elements of the array on the screen.

```
#include<iostream>
using namespace std;
   int main()
    {
     int arr[5],i;
     int *p=arr;
     cout<<"Enter five numbers: ";
     cin>>*p>>*(p+1)>>*(p+2)>>*(p+3)>>*(p+4);
     cout<<"Your numbers are:\n";
     for(i=0;i<5;i++)
     cout<<arr[i]<<endl;
     return 0;
     }
```

4) Modify the solution of exercise 1 in order to print the elements of the array in reverse order using a pointer.

```
#include<iostream>
using namespace std;
   int main()
    {
     int arr[5],i;
     int *p=arr;
     cout<<"Enter five numbers: ";
     cin>>*p>>*(p+1)>>*(p+2)>>*(p+3)>>*(p+4);
     cout<<"Your numbers are:\n";
     for(i=4;i>=0;i--)
     cout<<*(p+i)<<endl;
     return 0;
    }
```

5) Write a C++ function to sort an array of ten integer values in ascending order.

The function will accept two arguments-- a pointer that points to the array and the array size. The function returns a pointer that points to the sorted array.

```
#include<iostream>
using namespace std;
int *sortAsc(int *p, int size);
   int main()
    {
     int arr[]={23,34,2,3,5,12,42,56,89,8};
     int *p=sortAsc(arr,10);
     //output the sorted array
     int i;
     for(i=0;i<10;i++)
       cout<<*(p+i)<<endl;
       return 0;
     }

int *sortAsc(int *p, int n){
    int i,j;
    for(i=0;i<n;i++)
        for(j=i+1;j<n;j++)
            if(*(p+j)<*(p+i))
              {
                int temp=*(p+j);
                *(p+j)=*(p+i);
                *(p+i)=temp;
                }
   return p;
}
```

6) Modify the solution of exercise 1 in order to sort the array in descending order.

```
#include<iostream>
using namespace std;
int *sortAsc(int *p, int size);
   int main()
  {
     int arr[]={23,34,2,3,5,12,42,56,89,8};
     int *p=sortAsc(arr,10);
     //output the sorted array
     int i;
     for(i=0;i<10;i++)
     cout<<*(p+i)<<endl;
     return 0;
    }

int *sortAsc(int *p, int n){
    int i,j;
    for(i=0;i<n;i++)
        for(j=i+1;j<n;j++)
            if(*(p+j)>*(p+i))
              {
                int temp=*(p+j);
                *(p+j)=*(p+i);
                *(p+i)=temp;
                }
   return p;
}
```