Q1 WAP to calculate GCD/HCF of two integers:

(i) using iterative func^n.

(ii) using recursive func^n.

```
#include <iostream>
using namespace std;
int gcd_itt(int n1, int n2){
    int hcf;
    if(n2>n1){
        int temp =n2;
        n2 = n1;
        n1 = temp;
    }
for(int i=1; i<=n2 ;i++) {
        if( n1%1==0 && n2%i==0){
            hcf = i;
        }
    }
    return hcf;
}
int gcd_rec(int a, intb) {
    if( a==0) { return b;}
    if ( b==0){ return a;}
    if (a==b) { return a;}
    if (a>b) { gcd_rec(a-b, b);}
    return gcd_rec( a, b-a);
}
int main(){
    int a=5, b=6;
    cout<<"GCD using itteration = "<< gcd_itt(a,b)<<endl;
    cout<<" gcd using recursion ="<<gcd_rec(a,b)<<endl;
    return 0;}
```

```
In-eisoyus0.1p4' '--stdout=Microsoft-M
--dbgExe=C:\msys64\mingw64\bin\gdb.exe
GCD using Itteration = 1
GCD using Recurssion = 1
PS T:\KIIT\DSA\DSA LAB>
```

Q2 WAP to find out the sum of n elements of an integer array a[] by using recursion.

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

int sum_rec (int a[], int n) {
        if (n<=0)
            return 0;
        return (sum_rec(a, n-1) + a[n-1]);
}
int main() {
    int ar[5] = {1, 2, 3, 4, 5};
    cout << "sum = " << sum_rec(ar, 5);
    return 0;
}
```

```
in-3jz10eed.13y --stdout=Microsof
--dbgExe=C:\msys64\mingw64\bin\gdb.
Sum= 15
PS T:\KIIT\DSA\DSA LAB>
```

Q3 WAP with a funcⁿ that takes three variable (a, b, c) as call by reff. parameters and rotates the values stored so that value a goes to b, b to c and c to a.

```
#include <stdio.h>
void swap_ptr( int &a, int &b, int &c) {
        int temp = b;
        b = a;
        a = c;
        c = temp;
}
int main() {
        int a=10, b=3, c=7;
        printf("Before swapping: \n a = %d \n b = %d \n c = %d \n",
                                                        a, b, c);

        swap_ptr( a, b, c);
        printf("After: \n a= %d, \n b = %d, \n c = %d", a, b, c);
        return 0;
}
```

```
--dbgExe=C:\msys64\mingw64\b
Before Swapping:
a = 10
b = 3
c = 7
After Swapping:
a = 7
b = 10
c = 3
PS T:\KIIT\DSA\DSA LAB>
```

Q4 WAP to display values in reverse order from an integer array using pointer.

```
#include <iostream>
using namespace std;
int main(){
    int ar[5] = {1,2,3,4,5};
    int *p = NULL;
    p = ar;
    for(int i=4; i>=0; i--){
        cout<< *(p+i) << " ";
    }
    return 0;
}
```

```
--dbgExe=C:\msys64\mingw64\bin\gdb.ex
5 4 3 2 1
PS T:\KIIT\DSA\DSA LAB>
```

Q5 WAP to store n elements in an array using DMA and print the elements using pointer

```
#include <iostream>
using namespace std;
int main() {
    int n=0;
cout<<"Enter no. of elements: ";
cin>>n;
int *p = (int *) malloc (n * sizeof(int));
if(!p) {
    cout<<"Insufficient memory\n";
    return 0;
}

else {
cout<<"\n Enter value of Array";
for(int i=0; i<n; ++i){
        cin>> p[i];

}
cout<<"\n Elemnts in array are: ";
 for(int i=0; i<n; i++) {
     cout<< p[i] <<" ";}

}
}
return 0;

}
```

```
--dbgExe=C:\msys64\mingw64\bin\gdb.ex
Enter no. of elements: 5

Enter Value of Array: 3 4 0 9 1

Elements in array are: 3 4 0 9 1
PS T:\KIIT\DSA\DSA LAB>
```