**PROGRAM 5**

**Sort a given set of N integer elements using Insertion Sort technique and compute its time taken.**

**CODE:**

#include <stdio.h>

#include<stdlib.h>

#include<time.h>

void InsertionSort(int arr[], int n)

{

if (n <= 1)

return;

InsertionSort( arr, n-1 );

int nth = arr[n-1];

int j = n-2;

while (j >= 0 && arr[j] > nth)

{

arr[j+1] = arr[j];

j--;

}

arr[j+1] = nth;

}

void printArray(int arr[], int n)

{

int i;

for ( i = 0; i < n; i++)

{

printf("%d\t ", arr[i]);

}

}

int main()

{

int i,n,arr[1000];

double time;

clock\_t start,end;

printf("Enter the size of the array:");

scanf("%d",&n);

printf("The elements to be sorted are:\n");

for(i=0;i<n;i++)

{

arr[i] = rand()%100;

printf("%d\t",arr[i]);

}

printf("\nThe sorted array is:\n");

start=clock();

InsertionSort(arr,n);

printArray(arr, n);

end=clock();

time = ((double)(end - start))/CLOCKS\_PER\_SEC;

printf("\nTime taken to sort the array by using Insertion Sort is:%lf\n",time);

getch();

}

**OUTPUT:**

