C++ Assignments | Quick Sort | Week 12

1.Which of the following sorting algorithms is used along quicksort to sort the sub arrays?

a) Merge Sort
b) Selection Sort
c) Insertion Sort
d) Bubble Sort

ANSWER :- (C) INSERTION SORT

2.How many subarrays does the partitioning step of the quick sort algorithm divide the entire
array into?

a) one
b) two
c) depends on the elements of the array
d) depends on the size of the array

ANSWERP:-
(B) TWO

3.Given an array where all its elements are sorted in increasing order except two swapped
elements, sort it in linear time. Assume there are no duplicates in the array.

Input: A[] = [3, 8, 6, 7, 5, 9, 10]
Output: A[] = [3, 5, 6, 7, 8, 9, 10]

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

void sortArray(vector<int>& A) {
    int n = A.size();
    int first = -1, second = -1;

    // Find the two elements that are out of order
    for (int i = 0; i < n - 1; ++i) {
        if (A[i] > A[i + 1]) {
            if (first == -1) {
                first = i;
            } else {
                second = i + 1;
                break;
            }
        }
```

```
    }

    // Swap the two elements to restore sorted order
    swap(A[first], A[second]);
}

int main() {
    vector<int> A = {3, 8, 6, 7, 5, 9, 10};

    cout << "Input Array: ";
    for (int num : A) {
        cout << num << " ";
    }
    cout << endl;

    sortArray(A);

    cout << "Sorted Array: ";
    for (int num : A) {
        cout << num << " ";
    }
    cout << endl;

    return 0;
}
```