# Rajalakshmi Engineering College

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## NeoColab_REC_CS23231_DATA STRUCTURES

## REC_DS using C_Week 6_MCQ_Updated_1

Attempt : 1
Total Mark : 20
Marks Obtained : 19

### Section 1 : MCQ

1. Let P be a quick sort program to sort numbers in ascending order using the first element as a pivot. Let t1 and t2 be the number of comparisons made by P for the inputs {1, 2, 3, 4, 5} and {4, 1, 5, 3, 2}, respectively. Which one of the following holds?

***Answer***

t1 > t2

***Status :*** Correct ***Marks : 1/1***

2. Why is Merge Sort preferred for sorting large datasets compared to Quick Sort?

***Answer***

Merge Sort has better worst-case time complexity

***Status :*** Correct ***Marks : 1/1***

3. What happens when Merge Sort is applied to a single-element array?

***Answer***

The array remains unchanged and no merging is required

***Status :*** Correct ***Marks : 1/1***

4. In a quick sort algorithm, where are smaller elements placed to the pivot during the partition process, assuming we are sorting in increasing order?

***Answer***

To the left of the pivot

***Status :*** Correct ***Marks : 1/1***

5. Merge sort is _____.

***Answer***

Comparison-based sorting algorithm

***Status :*** Correct ***Marks : 1/1***

6. Which of the following methods is used for sorting in merge sort?

***Answer***

merging

***Status :*** Correct ***Marks : 1/1***

7. Which of the following strategies is used to improve the efficiency of Quicksort in practical implementations?

***Answer***

Choosing the pivot randomly or using the median-of-three method

***Status :*** Correct **Marks : 1/1**

8. Which of the following is true about Quicksort?

***Answer***

It is an in-place sorting algorithm

***Status :*** Correct **Marks : 1/1**

9. In a quick sort algorithm, what role does the pivot element play?

***Answer***

It is used to partition the array

***Status :*** Correct **Marks : 1/1**

10. Consider the Quick Sort algorithm, which sorts elements in ascending order using the first element as a pivot. Then which of the following input sequences will require the maximum number of comparisons when this algorithm is applied to it?

***Answer***

22 25 76 67 50

***Status :*** Wrong **Marks : 0/1**

11. Is Merge Sort a stable sorting algorithm?

***Answer***

Yes, always stable.

***Status :*** Correct **Marks : 1/1**

12. What is the best sorting algorithm to use for the elements in an array that are more than 1 million in general?

***Answer***

Quick sort.

***Status :*** Correct ***Marks : 1/1***

13. What is the main advantage of Quicksort over Merge Sort?

***Answer***

Quicksort requires less auxiliary space

***Status :*** Correct ***Marks : 1/1***

14. The following code snippet is an example of a quick sort. What do the 'low' and 'high' parameters represent in this code?

```
void quickSort(int arr[], int low, int high) {
    if (low < high) {
        int pivot = partition(arr, low, high);
        quickSort(arr, low, pivot - 1);
        quickSort(arr, pivot + 1, high);
    }
}
```

***Answer***

The range of elements to sort within the array

***Status :*** Correct ***Marks : 1/1***

15. Which of the following scenarios is Merge Sort preferred over Quick Sort?

***Answer***

When sorting linked lists

***Status :*** Correct ***Marks : 1/1***

16. Which of the following modifications can help Quicksort perform

better on small subarrays?

***Answer***

Switching to Insertion Sort for small subarrays

***Status :*** Correct ***Marks : 1/1***

17. Which of the following statements is true about the merge sort algorithm?

***Answer***

It requires additional memory for merging

***Status :*** Correct ***Marks : 1/1***

18. What happens during the merge step in Merge Sort?

***Answer***

Two sorted subarrays are combined into one sorted array

***Status :*** Correct ***Marks : 1/1***

19. Which of the following sorting algorithms is based on the divide and conquer method?

***Answer***

Merge Sort

***Status :*** Correct ***Marks : 1/1***

20. Which of the following is not true about QuickSort?

***Answer***

It can be implemented as a stable sort

***Status :*** Correct ***Marks : 1/1***