**Unit-1**

**Data Structures Searching Sorting**

1. Which of the following is non-liner data structure?
   1. A) Stacks B) List C) Strings D) Trees
2. The logical or mathematical model of a particular organization of data is called a ………
   1. A) Data structure B) Data arrangement C) Data configuration D) Data formation
3. A sorted file contains 16 items. Using binary search, the maximum number of comparisons to search for an item in this file is ………..
   1. (A) 15 (B) 8 (C) 1 (D) 4
4. The sorting technique where array to be sorted is partitioned again and again in such a way that all elements less than or equal to partitioning element appear before it and those which are greater appear after it, is called …………..
   1. (A) Merge sort (B) Quick sort (C) Selection sort (D) None of these
5. The worst case of quick sort has order …………..

(A) O(n2) (B) O(n) (C) O (n log2 n) (D) O (log2 n)

1. You have to sort a list L consisting of a sorted list followed by a few “random” elements.

(A) Bubble sort (B) Selection sort

(C) Quick sort (D) Insertion sort

1. Which of the following sorting algorithm is of divide-and-conquer type?

a. Bubble sort b. Insertion sort c. Quick sort d. All of above

1. Two main measures for the efficiency of an algorithm are

a. Processor and memory b. Complexity and capacity

c. Time and space d. Data and space

1. The Worst case occur in linear search algorithm when

a)Item is somewhere in the middle of the array b)Item is not in the array at all

c)Item is the last element in the array

d)Item is the last element in the array or is not there at all

1. Finding the location of the element with a given value is:

a. Traversal b. Search c. Sort d. None of above

1. Where is linear searching used?  
   a) When the list has only a few elements

b) When performing a single search in an unordered list  
c) Used all the time

d) When the list has only a few elements and When performing a single search in an unordered list

1. What is the best case for linear search?  
   a) O(nlogn) b) O(logn) c) O(n) d) O(1)
2. What is the worst case for linear search?  
   a) O(nlogn) b) O(logn) c) O(n) d) O(1)
3. What is the advantage of recursive approach than an iterative approach?  
   a) Consumes less memory b) Less code and easy to implement  
   c) Consumes more memory d) More code has to be written
4. Given an input arr = {2,5,7,99,899}; key = 899; What is the level of recursion?  
   a) 5 b) 2 c) 3 d) 4
5. What is the worst case complexity of binary search using recursion?  
   a) O(nlogn) b) O(logn) c) O(n) d) O(n2)
6. Which of the following is the most desirable condition for interpolation search?  
   a) array should be sorted  
   b) array should not be sorted but the values should be uniformly distributed  
   c) array should have a less than 64 elements  
   d) array should be sorted and the values should be uniformly distributed
7. Interpolation search is a variation of?  
   a) Linear search b) Binary search

c) Jump search d) Exponential search

1. What is the time complexity of interpolation search when the input array has uniformly distributed values and is sorted?  
   a) O(n) b) O(log log n) c) O(n log n) d) O(log n)
2. Choose the recursive formula for the Fibonacci series.(n>=1)  
   a) F(n) = F(n+1) + F(n+2) b) F(n) = F(n) + F(n+1)

c) F(n) = F(n-1) + F(n-2) d) F(n) = F(n-1) – F(n-2)

1. How many passes does an insertion sort algorithm consist of?  
   a) N b) N-1 c) N+1 d) N2
2. Which of the following real time examples is based on insertion sort?  
   a) arranging a pack of playing cards b) database scenarios and distributes scenarios  
   c) arranging books on a library shelf d) real-time systems
3. Which of the following sorting algorithms is the fastest for sorting small arrays?  
   a) Quick sort b) Insertion sort c) Shell sort d) Heap sort
4. Which of the following examples represent the worst case input for an insertion sort?  
   a) array in sorted order b) array sorted in reverse order  
   c) normal unsorted array d) large array
5. Which of the following sorting algorithm is best suited if the elements are already sorted?  
   a) Heap Sort b) Quick Sort c) Insertion Sort d) Merge Sort
6. What is the advantage of selection sort over other sorting techniques?  
   a) It requires no additional storage space b) It is scalable  
   c) It works best for inputs which are already sorted d) It is faster than any other sorting technique
7. What is the worst case complexity of bubble sort?  
   a) O(nlogn) b) O(logn) c) O(n) d) O(n2)
8. What is the average case time complexity of merge sort?  
   a) O(n log n) b) O(n2) c) O(n2 log n) d) O(n log n2)
9. What is the auxiliary space complexity of merge sort?  
   a) O(1) b) O(log n) c) O(n) d) O(n log n)
10. Which of the following method is used for sorting in merge sort?  
    a) merging b) partitioning c) selection d) exchanging
11. Which of the following methods is the most effective for picking the pivot element?  
    a) first element b) last element c) median-of-three partitioning d) random element
12. Which is the safest method to choose a pivot element?  
    a) choosing a random element as pivot b) choosing the first element as pivot  
    c) choosing the last element as pivot d) median-of-three partitioning method
13. What is the average running time of a quick sort algorithm?  
    a) O(N2) b) O(N) c) O(N log N) d) O(log N)
14. How many sub arrays does the quick sort algorithm divide the entire array into?  
    a) one b) two c) three d) four