

**Chapter 5. Sorting**

1. Which of the following is a comparison-based sorting technique?  
a) Counting Sort      **b) Bubble Sort**      c) Radix Sort      d) Bucket Sort
2. In Bubble Sort, after the first pass, which element is guaranteed to be in its correct position?  
a) Minimum element      **b) Maximum element**  
c) Middle element      d) Random element
3. If an array of 5 elements [20, 10, 50, 40, 30] is sorted using Selection Sort, which element will be placed first in its correct position?  
a) 20      **b) 10**      c) 50      d) 30
4. Which of the following sorting algorithms is the fastest for sorting small arrays?  
a) Quick sort      b) Shell sort      **c) Insertion sort**      d) Heap sort
5. What is the advantage of selection sort over other sorting techniques?  
a) It is faster than any other sorting technique  
b) It is scalable  
c) It works best for inputs which are already sorted  
**d) It requires no additional storage space**
6. How many passes does an insertion sort algorithm consist of?  
a) N      **b) N-1**      c) N+1      d)  $N^2$
7. What will be the number of passes to sort the elements using insertion sort?  
14, 12, 16, 6, 3, 10  
a) 6      **b) 5**      c) 7      d) 1
8. 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
9. In the following scenarios, when will you use selection sort?  
a) The input is already sorted  
b) A large file has to be sorted  
**c) Large values need to be sorted with small keys**  
d) Small values need to be sorted with large keys
10. Bubble Sort repeatedly compares:  
a) Current element with first element  
**b) Adjacent elements**  
c) First and last elements  
d) Middle elements only
11. Bubble Sort is best used when:  
a) Data set is very large  
**b) Data set is almost sorted**  
c) Data set is completely random  
d) Data set has duplicates

12. In Selection Sort, during each pass:

- a) Largest element is selected and swapped to the beginning
- b) Smallest element is selected and swapped to the beginning**
- c) Random element is selected and swapped
- d) None of the above

13. Time complexity of Selection Sort in worst case is:

- a)  $O(n^2)$**
- b)  $O(n \log n)$
- c)  $O(n)$
- d)  $O(\log n)$

14. The time complexity of Bubble Sort in the worst case is:

- a)  $O(n)$
- b)  $O(\log n)$
- c)  $O(n^2)$**
- d)  $O(n \log n)$

15. The time complexity of Insertion Sort in the worst case is:

- a)  $O(n)$
- b)  $O(\log n)$
- c)  $O(n^2)$**
- d)  $O(n \log n)$

16. The amount of time or number of basic operations an algorithm requires to solve a problem is

- a) Time Complexity**
- b) Space Complexity
- c) Best Case
- d) Worst Case

17. Any algorithm that does not have any loop will have time complexity as

- a)  $n$
- b)  $n^2$
- c) 0
- d) 1**

18. An algorithm that have 1 to  $n$  loop will have time complexity as

- a)  $n$**
- b)  $n^2$
- c) 0
- d) 1

19. An algorithm that have nested loop will have time complexity as

- a)  $n$
- b)  $n^2$**
- c) 0
- d) 1

20. The time complexity of constant time algorithm is

- a)  $n$
- b)  $n^2$
- c) 0
- d) 1**

21. The time complexity of linear time algorithm is

- a)  $n$**
- b)  $n^2$
- c) 0
- d) 1

22. The time complexity of quadratic time algorithm is

- a)  $n$
- b)  $n^2$**
- c) 0
- d) 1

23. If there is a nested loop and also a single loop, the time complexity will be

- a)  $n$
- b)  $n^2$**
- c) 0
- d) 1

24. Any algorithm having time complexity 1 is known as

- a) Constant time algorithm**
- b) Linear time algorithm
- c) Quadratic time algorithm
- d) Best Case algorithm

25. Any algorithm having time complexity  $n$  is known as

- a) Constant time algorithm
- b) Linear time algorithm**
- c) Quadratic time algorithm
- d) Best Case algorithm

26. Any algorithm having time complexity  $n^2$  is known as

- a) Constant time algorithm
- b) Linear time algorithm
- c) Quadratic time algorithm**
- d) Best Case algorithm

27. In algorithm, every iteration through each element of a list is called

- a) pass**
- b) step
- c) process
- d) logic

28. The bubble sort makes a total of how many passes to sort the list?  
a)  $n$     **b)  $n - 1$**     c)  $n+1$     d)  $n^2$
29. The process of ordering or arranging a given collection of elements in some particular order is called  
**a) sorting**    b) ordering    c) indexing    d) ascending
30. The selection sort makes a total of how many passes to sort the list ?  
a)  $n$     **b)  $n - 1$**     c)  $n+1$     d)  $n^2$
31. Name the sorting technique, in which the sorted list is traversed from the backward direction to find the position where the unsorted element could be inserted in each pass is  
a) bubble sort    b) selection sort    **c) insertion sort**    d) all of the above