Data Structure and Algorithm (DSA)
Unit – 3: Searching and Sorting
(Previous Year Questions)

S No	Questions	Mark	Year
1.	Write a program for sorting the array of 10 elements using the Bubble Sort method.	02	2014-15
2.	Construct a Binary Search Tree from the given values. Consider the first value as the root value. Values: 49,22, 25, 90, 82, 7, 13, 47, 49, 63	02	2014-15
3.	What happens if the binary search tree is left oriented or right oriented? Explain the problem and give the solution.	10	2014-15
4.	What is m-way search tree? Construct the B-Tree form the following	05	2014-15
5.	Create a heap and sort the following element using heap sort 12, 8, 10, 6, 4, 10, 6, 11, 9, 8, 14, 1	05	2014-15
6.	Write an algorithm for sorting a set of integers using quick sort. What is the case average time complexity of the procedure?	10	2014-15
7.	With the help of algorithm explain the binary search and also discuss it's time complexity.	10	2014-15
8.	Write and the bubble sort algorithms for a given set of 'n' data's where 'k^{th}' is the largest data.	10	2014-15

9.	Compare and contrast average case behaviour of Quick Sort and Merge Sort.	10	2014-15
10.	Explain Depth First Search. Give example to support your explanation.	10	2014-15
11.	Distinguish between intimal sorting and external sorting?	02	2014-15

12.	How many maximum comparisons required in searching an element in a binary search tree?	02	2014-15
13.	Write an algorithm for inserting a node in binary search tree. A binary tree T has 9 nodes. The Inorder and Preorder traversal of T yield with the following sequence. Inorder: E, A, C, K, F, H, D, B, G Preorder: F, A, E, K, C, D, H, G, B Draw the tree T.	10	2014-15
14.	Write a function in c for insertion sort. Trace your algorithm on the following data to sort the list: 77, 33, 44, 11, 88, 22, 66, 55.	10	2014-15
15.	Write an algorithm for inserting a node a binary search tree. Suppose the following 10 members are inserted in order into an empty binary search tree T: 50, 48, 35, 44, 80, 70, 10, 55, 11, 85. Draw the tree T.	10	2014-15
16.	Write an algorithm for sorting a set of integers using quick sort. What is the case average time complexity of the procedure?	10	2014-15
17.	Write an algorithm for merge sorting using the algorithm sort in according to order 10, 25, 16, 5, 35, 48, 8	10	2014-15

18.	At most, how many comparisons are required to search an element from a sorted vector of 1023 element using the binary search algorithm?	02	2015-16
19.	A certain sorting algorithm is applied to the following data set 45, 1, 27, 36, 54, 90. After two passes the rearrangement of the data is 1, 27, 45, 36, 54, 90. Identify the sorting algorithm that was applied? Justify the answer.	02	2015-16
20.	Write a C program to search an element in array using binary search technique.	10	2015-16
21.	Perform two-way merge sort operation on the array given 24 | 7 | 46 | 41 | 85 | 4 | 94 | 14	10	2015-16
22.	Sort 20, 35, 40, 100, 3, 10, 15 using selection sort.	15	2015-16
23.	Perform the Merge Sort on following set of elements. Also, write merge sort algorithm. 18, 25, 4, 26, 10, 15, 20, 5.	10	2016-17
24.	How does bubble sort work? Explain.	02	2019-20
25.	Why is quick sort named as quick? Show the steps of quick sort on the following set of elements:25, 57, 48, 37, 12, 92, 86, 33 Assume the first element of the list to be the pivot element.	10	2019-20
26.	How binary search is different from linear search? Apply binary search to find item 40 in the sorted array. I l, 22, 380, 40, 44, 55, 60, 66, 77, 80 88 99. Also discuss the complexity of binary search.	10	2019-20

27.	Use quick sort algorithm to sort 15,22,30,10,15,64,1,3,9,2. Is it a stable sorting algorithm? – Justify.	10	2017-18
28.	Explain the following: I. Heap Sort II. Radix Sort.	07	2017-18
29.	Write algorithm sort. Trace your algorithm on the following data to sort the list: 2, IQ, 4"21, 7, 56, 51, 85, 59, 1, 9, 10. How the choice of pivot element affects the efficiency of the algorithm.	07	2018-19
30.	What do you understand by stable and in-place sorting?	02	2018-19
31.	How do you calculate the complexity of sorting algorithms? Also, write a recursive function in 'C' to implement the merge sort on a given set of integers.	10	2015-16
32.	What is sorting? How is sorting essential for database applications?	02	2016-17
33.	What is a quick sort? Sort the given values using quicksort; present all steps/iterations: 38, 81, 22, 48, 13, 69, 93, 14, 45, 58, 79, 72.	10	2016-17
34.	Differentiate sequential search and binary search.	02	2020-21
35.	Write an algorithm for breadth-first search (BFS). And explain with the help of a suitable example.	10	2020-21
36.	Write a algorithm for merge sort and apply on the following elements 45,32,65,76,23,12,54,67,22,87.	10	2020-21
37.	Write a c program for index sequential search.	10	2020-21