

No Negative Marking. Only Single Answer in all the questions. Overwriting or cutting is not allowed. Don't use pencil.

1	Given an unordered array of n elements, the time complexity to convert this array into a heap data structure by an efficient algorithm is a) $O(\log n)$ b) $O(n)$ c) $O(n \log n)$ d) $O(n^2)$
2	Given 1,00,0000 positive integers and the highest of them is 512. Which sorting technique will be the best to use? a) Merge Sort b) Selection Sort c) Heap Sort d) Counting Sort
3	Which of the following properties of red black tree force the binary search tree to remain balanced? a) Every node has to be either red or black. b) Root and leaves of the tree are always black. c) Red node should have black children. d) The black height from any node to the leaves should be same.
4	In case of a data structure the complexities of insertion, deletion, search are $O(1)$, $O(n)$, $O(\log n)$. If there is a rough idea about the ratio of times these operations are performed in our application, then which technique should be used to find the overall complexity of the data structure? a) Randomized Complexity b) Worst case complexity c) Amortized Complexity d) Empirical complexity
5	To find those vertices in the graph which don't have edges between them is called a) Vertex Cover Problem b) Clique Problem c) Independent Set Problem d) Hamiltonian Path Problem
6	Problem of clustering of numbers is faced in one of the following techniques of hashing a) Linear Probing b) Quadratic Probing c) Double Hashing d) Perfect Hashing
7	Match the Following terms (A) All pairs shortest paths (1) Greedy (B) Quick sort (2) Depth first search (C) Minimum weight spanning tree (3) Dynamic programming (D) Connected component (4) Divide-and-conquer (a) A-2, B-4, C-1, D-3 (b) a - 3, b - 4, c - 1, d - 2 (c) A-3, B-4, C-2, D-1 (d) a - 4, b - 1, c - 2, d - 3
8	Max Flow or min cut problem uses a) Floyd-Warshall Algorithm b) Bellman-Ford Algorithm c) Knuth-Morris-Pratt Algorithm d) Ford-Fulkerson Algorithm
9	If T_1 is time taken by a processor to do some work and T_p is time taken by P processors to do the same work, then the speedup is given by a) $T_1 + T_p$ b) $T_1 * T_p$ c) T_p / T_1 d) T_1 / T_p
10	If there are n elements to be inserted in an empty skip list, space complexity of the Skip List data structure is a) $n \log n$ b) $\log n$ c) $2n$ d) n^2