

Only 10 Questions will be evaluated. Every Question carries one mark. Encircle the right choice.

1: A union-find data-structure is commonly applied while implementing:

- (a) A depth-first search traversal of a graph.
- (b) A breadth-first search traversal of a graph.
- (c) Computing the minimum spanning tree of a graph.
- (d) Computing the all-pairs shortest path in a graph.

2: The maximum number of comparisons for a retrieval operation in a binary search tree is the

- (a) Length of the tree.
- (b) Height of the tree.
- (c) Number of internal nodes in the tree.
- (d) Number of leaves in the tree.

3: There are several factors that affect efficiency of lookup operations in hash table. Which is not one of those factors?

- (a) Number of elements stored in the hash table.
- (b) Size of elements stored in the hash table.
- (c) Number of buckets in the hash table.
- (d) Quality of the hash function.
- (e) All of the above factors affect the efficiency

4: A complete graph with 5 vertices has the following edges:

- (a) 5
- (b) 8
- (c) 10
- (d) 11

5: Which of the following statements about binary trees is NOT true?

- (a) Every binary tree has at least one node.
- (b) Every non-empty tree has exactly one root node.
- (c) Every node has at most two children.
- (d) Every non-root node has exactly one parent.

6: The spanning tree of connected graph with 10 vertices contains:

- (a) 8 edges
- (b) 9 edges
- (c) 10 edges
- (d) 20 edges

7: If a 5 is inserted into the heap below, and the heap condition is restored using the respective function call, into which position will the 5 go?

I	0	1	2	3	4	5	6	7	8	9	10
A[i]	3	9	15	10	17	16	23	19	22	30	33

- (a) A[0]
- (b) A[1]
- (c) A[2]
- (d) A[11]

8: When the entries 7, 4, 6, 1, 2, 3, 8, 5 are successively inserted into an initially empty binary search tree, what is the height, level & depth of the resulting tree?

- (a) 7, 8, 7
- (b) 7, 7, 8
- (c) 6, 7, 6
- (d) 6, 6, 7

9: What is the time complexity of Huffman Coding?

- (a) O(n)
- (b) O(n log n)
- (c) O(n log² n)
- (d) O(n²)

10: Preorder is

- (a) Depth First order
- (b) Breadth First order
- (c) Topological order
- (d) Linear order

11: Which of the following is not a stable sorting algorithm?

- (a) Insertion sort
- (b) Selection sort
- (c) Radix sort
- (d) Merge sort

12: Primarily clustering is a deficiency of which data structure?

- (a) hashing with chaining
- (b) double hashing
- (c) linear probing
- (d) red-black trees