

## CS-301 Final Term Exams Preparation Virtual University

Sr	Questions	Answers Choice
1	What requirement is placed on an array, so that binary search may be used to locate an entry?	<p>A. The array elements must form a heap.</p> <p>B. The array must have at least 2 entries</p> <p>C. <b>The array must be sorted.</b></p> <p>D. The array's size must be a power of two.</p>
2	Consider a min heap, represented by the following array: 3,4,6,7,5,10 After inserting a node with value 1.Which of the following is the updated min heap?	<p>A. 3,4,6,7,5,10,1</p> <p>B. 3,4,6,7,5,1,10</p> <p>C. 3,4,1,5,7,10,6</p> <p>D. <b>1,4,3,5,7,10,6</b> close to correct but correct ans is 1,4,3,7,5,10,6</p>
3	The arguments passed to a function should match in number, type and order with the parameters in the function definition.	<p>A. <b>True</b></p> <p>B. False</p> <p>C. both</p>
4	By using _____ we avoid the recursive method of traversing a Tree, which makes use of stacks and consumes a lot of memory and time.	<p>A. Binary tree only</p> <p>B. <b>Threaded binary tree</b></p> <p>C. Heap data structure</p> <p>D. Huffman encoding</p>
5	_____ only removes items in reserve order as they were entered	<p>A. <b>Stack</b></p> <p>B. Queue</p> <p>C. Both of these</p> <p>D. None of these</p>
6	Select the FALSE statement binary tree.	<p>A. <b>Every binary tree has at least one node.</b></p> <p>B. Every non-empty tree has exactly one root node.</p> <p>C. Every node has at most two children.</p> <p>D. Every non-root node has exactly one parent.</p>
7	Merge sort makes two recursive calls, which statement is true after these recursive calls, finish but before the merge step?	<p>A. Elements in the first half of the array are less than or equal to elements in the second half of the array</p> <p>B. None of the given options</p> <p>C. The array elements form a heap.</p> <p>D. <b>Elements in the second half of the array are less than or equal to elements in the first half of the array</b></p>
8	Which of the following statement is true about dummy node of threaded binary tree	<p>A. The left pointer of dummy node points to the itself while the right pointer points to the root of tree.</p> <p>B. <b>The left pointer of dummy node points to the root node of the tree while the right pointer points itself i.e. to dummy node</b></p> <p>C. The left pointer of dummy node points to the root node of the tree while the right pointer is always NULL</p> <p>D. The right pointer of dummy node points to the itself while the left pointer is always NULL</p>
9	Which of the following is not an example of equivalence relation:	<p>A. Electrical Connectivity</p> <p>B. Set of people</p> <p>C. <b>&amp;lt;= relation</b></p> <p>D. Set of pixels</p>
10	A queue is a data structure where elements are,	<p>A. <b>inserted at the front and removed from the back</b></p> <p>B. inserted and removed from the top.</p> <p>C. inserted at the back and removed from the front.</p> <p>D. inserted and removed from both ends.</p>

11	Which of the given option is NOT a factor in Union by Size:	<p>A. Maintain sizes (number of nodes) of all trees, and during union.</p> <p>B. Make smaller tree, the subtree of the larger one</p> <p>C. Make the larger tree, the subtree of the smaller one.</p> <p>D. Implementation: for each root node <math>i</math>, instead of setting <math>parent[i]</math> to <math>-1</math>, set it to <math>-k</math> if tree rooted at <math>i</math> has <math>k</math> nodes</p>
12	In a perfectly balanced tree the insertion of a node needs _____ .	<p>A. One rotation</p> <p>B. Two rotations</p> <p>C. Rotations equal to number of levels</p> <p>D. No rotation at all</p>
13	A simple sorting algorithm like selection sort or bubble sort have a worstcase of	<p>A. <math>O(1)</math> time because all lists take the same amount of time to sort</p> <p>B. <math>O(n)</math> time because it has to perform <math>n</math> swaps to order the list.</p> <p>C. <math>O(n^2)</math> time because sorting 1 element takes <math>O(n)</math> time - After 1 pass through the list, either of these algorithms can guarantee that 1 element is sorted.</p> <p>D. <math>O(n^3)</math> time, because the worst case has really random input which takes longer to sort.</p>
14	The definition of transitive property is	<p>A. For all element <math>x</math> member of <math>S</math>, <math>x R x</math></p> <p>B. For all elements <math>x</math> and <math>y</math>, <math>x R y</math> if and only if <math>y R x</math></p> <p>C. For all elements <math>x</math>, <math>y</math> and <math>z</math>, if <math>x R y</math> and <math>y R z</math> then <math>x R z</math></p> <p>D. For all elements <math>w</math>, <math>x</math>, <math>y</math> and <math>z</math>, if <math>x R y</math> and <math>w R z</math> then <math>x R z</math></p>
15	Suppose that a selection sort of 100 items has completed 42 iterations of the main loop. How many items are now guaranteed to be in their final spot (never to be moved again)?	<p>A. 21</p> <p>B. 41</p> <p>C. 42</p> <p>D. 53</p>
16	Which of the following statement is NOT correct?	<p>A. In linked list the elements are necessarily to be contiguous</p> <p>B. In the linked list the elements may locate at far positions in the memory</p> <p>C. in the linked list each elements also has the address of the elements next to it</p> <p>D. In an array the elements are contiguous</p>
17	Huffman encoding uses _____ tree to develop codes of varying lengths for the letters used in the original message	<p>A. Linked List</p> <p>B. Stack</p> <p>C. Queue</p> <p>D. Binary tree</p>
18	Which formula is the best approximation for the depth of a heap with $n$ nodes?	<p>A. <math>\log_2(n)</math></p> <p>B. The number of digits in <math>n</math> (base 10), e.g., 145 has three digits</p> <p>C. The square root of <math>n</math></p> <p>D. <math>n</math></p>
19	Here is an array of ten integers: 5 3 8 9 1 7 0 2 6 4 The array after the FIRST iteration of the large loop in a selection sort (sorting from smallest to largest).	<p>A. 0 3 8 9 1 7 5 2 6 4</p> <p>B. 2 6 4 0 3 8 9 1 7 5</p> <p>C. 2 6 4 9 1 7 0 3 8 5</p> <p>D. 0 3 8 2 6 4 9 1 7 5</p>
20	Which of the following method is helpful in creating the heap at once?	<p>A. insert</p> <p>B. add</p> <p>C. update</p> <p>D. preculcateDown</p>