Summary in Graph

Exam Summary (GO Classes Test Series 2024 | Data Structures | Test 4)

Qs. Attempted:	**11** 4 + 7	**Correct Marks:**	**9** 3 + 6
Correct Attempts:	**6** 3 + 3	**Penalty Marks:**	**0** 0 + 0
Incorrect Attempts:	**5** 1 + 4	**Resultant Marks:**	**9** 3 + 6

Total Questions:	**15** 5 + 10
Total Marks:	**25** 5 + 20
Exam Duration:	**45 Minutes**
Time Taken:	**45 Minutes**

EXAM RESPONSE   EXAM STATS   FEEDBACK

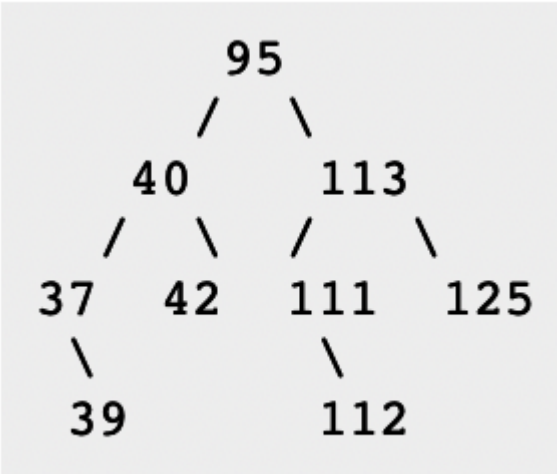
Technical

Q #1   Numerical Type   Award: 1   Penalty: 0   DS

Given a BST, there are some keys that, if inserted, will increase the height of the tree. For the BST below, let N be a number of integer keys (distinct from those already in the tree) for which this is true. Each key should increase the height if inserted alone, not with other keys.

Find N.

Your Answer: 38   Correct Answer: 1   Incorrect   Discuss

Q #2 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | DS

In an array-based implementation of a Heap, the right-child of the right-child of the node at index i, if it exists, can be found at what array location? Index of the array starts from 1.

   A. $4i + 3$
   B. $2i + 1$
   C. $4i + 1$
   D. $2i + 2$

Your Answer: A | Correct Answer: A | Correct | Discuss

Q #3 | Multiple Choice Type | Award: 1 | Penalty: 0.33 | DS

Suppose that T is a full binary tree. Consider two statements about T :

- $S1$: If T has 100 internal nodes then the number of leaves in T is 101.
- $S2$: If T has a total of 1001 nodes, then 500 of them must have children.

What is true about S1 and S2?

   A. $S1$ is correct but $S2$ is incorrect
   B. $S1$ is incorrect but $S2$ is correct
   C. Both are correct
   D. Both are incorrect

Your Answer: | Correct Answer: C | Not Attempted | Discuss

Q #4 | Multiple Select Type | Award: 1 | Penalty: 0 | DS

Consider a min heap with 1023 distinct integers. If root is at 0th level then fill the blank given in below sentence.
The 10th minimum of the heap might be at _____ level.

   A. 1
   B. 3
   C. 8
   D. 9

Your Answer: A;B;C;D | Correct Answer: A;B;C;D | Correct | Discuss

Q #5 | Numerical Type | Award: 1 | Penalty: 0 | DS

A min-heap consists of 2047 elements, the minimum number of comparisons required to determine the maximum number is _____.

Your Answer: 1023 | Correct Answer: 1023 | Correct | Discuss

Q #6 | Numerical Type | Award: 2 | Penalty: 0 | DS

Consider the binary tree where the number of nodes in each left sub-tree is within a factor of 2 of the number of nodes in the corresponding right sub-tree. Also, a node is allowed to have only one child if that child has no children. What will be the minimum number of nodes in such a tree with a height of 5? (root is at a height of 1).

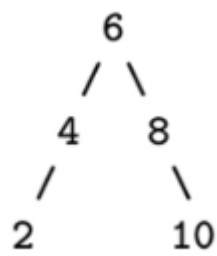**Your Answer:** | **Correct Answer: 12** | Not Attempted | Discuss

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Q #7 | Numerical Type | Award: 2 | Penalty: 0 | DS

The keys $2, 4, 6, 8,$ and 10 have been inserted, one by one, in some unknown order, into an initially empty BST. The result is this BST:

```
      6
     / \
    4   8
   /     \
  2       10
```

How many permutations of the $2, 4, 6, 8,$ and 10 will generate this particular BST?

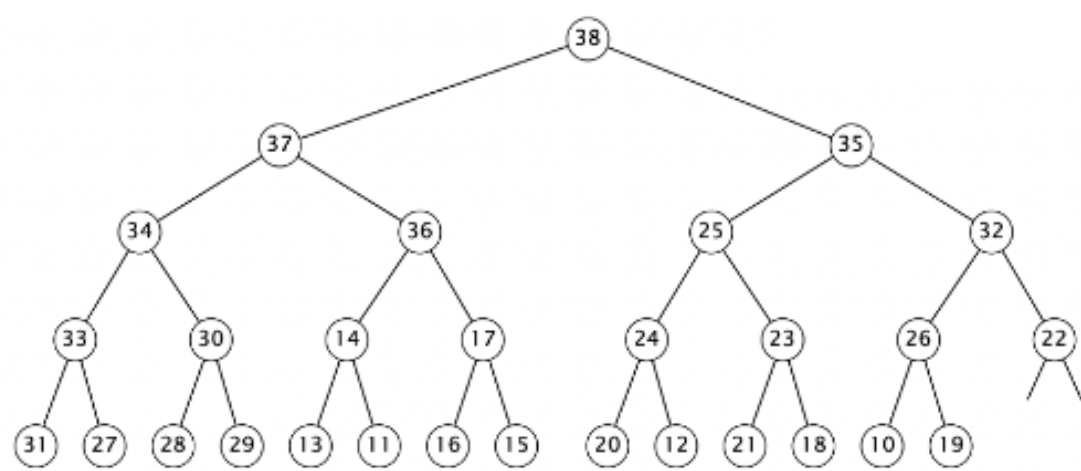**Your Answer: 6** | **Correct Answer: 6** | Correct | Discuss

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Q #8 | Multiple Select Type | Award: 2 | Penalty: 0 | DS

Consider the following binary heap.

Suppose that the last operation performed in the binary heap above was inserting the key x. What is/are possible values of x?

A. 19
B. 26
C. 32
D. 10

Your Answer: A;B;C;D | **Correct Answer: A;B;C** | Incorrect | Discuss

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Q #9 | Multiple Choice Type | Award: 2 | Penalty: 0.67 | DS

Suppose that a binary min-heap stores six elements with priorities $10, 20, 30, 40, 50,$ and 60 in its array A. What is the largest of these items that could be stored in $A[1]$? (indexing starts from zero)

    A. 20
    B. 30
    C. 40
    D. 50

| Your Answer: | | Correct Answer: C | | Not Attempted | | Discuss |

Q #10 | Multiple Choice Type | | Award: 2 | | Penalty: 0.67 | | DS |

Consider a binary min heap with n distinct elements such that the third largest element is a right child of the root.

What will be the MAXIMUM value of n?

    A. 7
    B. 8
    C. 10
    D. 11

| Your Answer: D | | Correct Answer: D | | Correct | | Discuss |

Q #11 | Multiple Select Type | | Award: 2 | | Penalty: 0 | | DS |

Which of the following is/are TRUE?

    A. Insertion into an AVL tree always increases the number of leaves.
    B. An AVL tree of height 3 has at least 7 nodes and at most 15 nodes
    C. If inserting a node into an AVL tree requires rebalancing, then the height of the entire tree does not change.
    D. When removing a node from an AVL tree with n nodes, then at most 3 vertices need to be rebalanced.

| Your Answer: A;B;D | | Correct Answer: B;C | | Incorrect | | Discuss |

Q #12 | Numerical Type | | Award: 2 | | Penalty: 0 | | DS |

Consider a binary tree in which the number of leaves (nodes with no children) in each left subtree is within one of the number of leaves in the corresponding right subtree. More precisely, for each node in the tree, $|$ number-of-leaves(left subtree) $-$ number-of-leaves(right subtree)$| \leq 1$. What is the worst-case height of such a tree of 20 nodes?

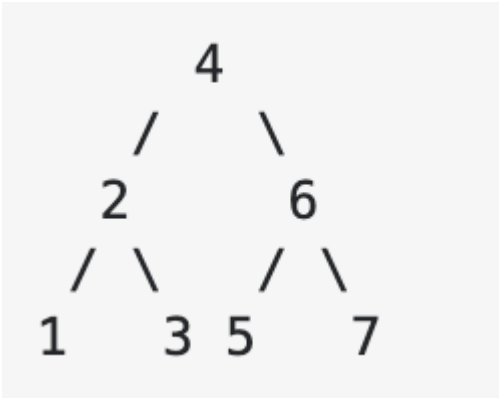| Your Answer: 4 | | Correct Answer: 19 | | Incorrect | | Discuss |

Q #13 | Numerical Type | | Award: 2 | | Penalty: 0 | | DS |

How many ways there were to insert the values $1 - 7$ into a binary search tree that would result in the following tree:

```
         4
       /    \
      2       6
    /  \     /  \
   1    3   5    7
```

Your Answer: 40 **Correct Answer: 80** Incorrect Discuss

Q #14 Numerical Type Award: 2 Penalty: 0 DS

With 7 nodes of distinct values, how many Binary search trees (BST) can be formed such that exactly 1 leaf node is present?

Your Answer: 64 **Correct Answer: 64** Correct Discuss

Q #15 Multiple Choice Type Award: 2 Penalty: 0.67 DS

When searching for the key value 30 in a binary search tree, nodes containing the key values $10, 20, 40, 50, 70, 80, 90$ are traversed, not necessarily in the order given.

What will be the probability to encounter a probe sequence such that 20 appears as the 3rd element in the probe?

    A. $1/21$
    B. $2/21$
    C. $1/7$
    D. $2/7$

Your Answer: **Correct Answer: B** Not Attempted Discuss

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