Started on	Sunday, 9 April 2023, 10:18 PM
State	Finished
Completed on	Sunday, 9 April 2023, 10:42 PM
Time taken	23 mins 46 secs
Marks	7.00/8.00
Grade	**8.75** out of 10.00 (**87.5**%)

Question 1

Correct

Mark 1.00 out of 1.00

Select the disadvantage of Binary Search among provided

- ○ a. Doesn't outperform Linear Search
- ○ b. Requires Tree data structure
- ◉ c. Requires a sequential storage ✔
- ○ d. Requires r\ecursion to search

The correct answer is: Requires a sequential storage

Question 2

Correct

Mark 1.00 out of 1.00

Which of the following statement(s) is/are correct regarding a binary search tree?

- ☑ a. Basic operations on any randomly built binary search tree take time proportional to the height of the tree. ✔
- ☐ b. It takes O(lg n) time to walk an n-node binary search tree.
- ☑ c. The expected height of a randomly built binary search tree is O(lg n). ✔
- ☐ d. Basic operations on any randomly built binary search tree take $\Theta(\lg n)$ time.

The correct answers are: The expected height of a randomly built binary search tree is O(lg n)., Basic operations on any randomly built binary search tree take time proportional to the height of the tree.

Question 3

Correct

Mark 1.00 out of 1.00

Following is a pseudo code to check given two Binary Trees are identical or not.

```
// Data structure for binary tree
class Node{
    int key;
    Node left, right;
}


//Algorithm
int isEqual(Node a, Node b)
{
    if ( Condition 1 )
        return true;

    return ( Condition 2 ) &&
            ( Condition 3 ) &&
            isEqual( a.left, b.left ) &&
            isEqual( Condition 4 );
}
```

select correct conditions for appropriate places.

Condition 4 | a.right, b.right   ⬍ | ✔

Condition 2 | a != null && b!=null   ⬍ | ✔

Condition 1 | x == null && y == null ⬍ | ✔

Condition 3 | a.key == b.key   ⬍ | ✔

The correct answer is: Condition 4 → a.right, b.right, Condition 2 → a != null && b!=null, Condition 1 → x == null && y == null, Condition 3 → a.key == b.key

Question 4

Correct

Mark 1.00 out of 1.00

Select whether the following statement is True/False.

Binary Search is appropriate for linked lists

Select one:

○ True

◉ False ✔

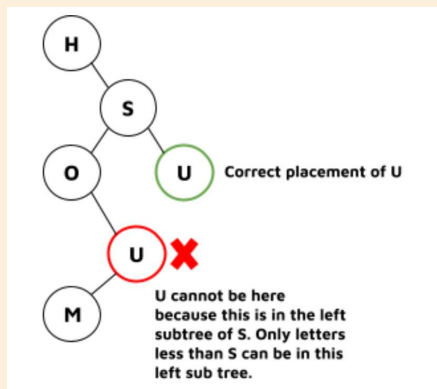The correct answer is 'False'.

Question 5

Incorrect

Mark 0.00 out of 1.00

Consider the following search probe sequences in a binary search tree. Which of these sequences is/are **not valid** ? (priority is given according to order of letters in the alphabet, i.e. B has higher priority than A, C has priority than B and so on)

Select one or more:

☑ a.   I, F, E, C, D ✖

☐ b.   H, S, O, U, M

☑ c.   T, Y, X, U ✖

☑ d.   H, S, O, M, N ✖

Your answer is incorrect.

The correct answer is:
H, S, O, U, M

Question 6

Correct

Mark 1.00 out of 1.00

The height of a tree is the length of the longest root-to-leaf path in it. The maximum and the minimum number of nodes in a binary tree of height 5 are:

○ a.   64 and 5, respectively

◉ b.   63 and 6, respectively ✔

○ c.   32 and 6, respectively

○ d.   31 and 5, respectively

The correct answer is: 63 and 6, respectively

Question 7

Correct

Mark 1.00 out of 1.00

The number of possible [binary search trees](#) with 5 nodes is

Answer: | 42 | ✔

Explanation

Refer to https://www.geeksforgeeks.org/total-number-of-possible-binary-search-trees-with-n-keys/. There is also a Python/ C++ code available at this link.

Also refer to Catalan Numbers @ https://en.wikipedia.org/wiki/Catalan_number

The correct answer is: 42

Question 8

Correct

Mark 1.00 out of 1.00

Consider numbers 3, 9, 1, 17, 14, 22, 20. These numbers are inserted in to a balanced binary tree, Which tree traversal method would output the following sequence.

14, 3, 1, 9, 20, 17, 22

○ a.   Postorder

○ b.   Non of the above

○ c.   Inorder

◉ d.   Preorder ✔

The correct answer is: Preorder