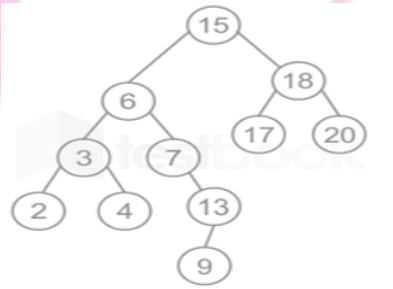
Tree Traversal
Assignment -#5

1. The pre-order traversal of a binary search tree is 15, 10, 12, 11, 20, 18, 16, 19. Which one of the following is the post-order traversal of the tree?
   a) 10, 11, 12, 15, 16, 18, 19, 20
   b) 11, 12, 10, 16, 19, 18, 20, 15
   c) 20, 19, 18, 16, 15, 12, 11, 10
   d) More than one of the above
   e) None of the above

2. What is the sequence of nodes when applying in-order traversal on the binary search tree given below?
   a) A, B, C, D, E, F, I, H, G
   b) A, C, D, E, B, F, G, H, I
   c) A, B, C, D, E, F, G, H, I
   d) More than one of the above
   e) None of the above

3. What is the in-order successor of 15 in the given binary search tree?



   a) 18
   b) 6
   c) 17
   d) More than one of the above
   e) None of the above

4. The post-order traversal of a binary tree is 8, 9, 6, 7, 4, 5, 2, 3, 1. The in-order traversal of the same tree is 8, 6, 9, 4, 7, 2, 5, 1, 3. The height of the binary tree above is _____.
   a) 3
   b) 4
   c) 5
   d) More than one of the above
   e) None of the above

5. Post-order traversal of a given binary search tree, T, produces the following sequence of keys: 10, 9, 23, 22, 27, 25, 15, 50, 95, 60, 40, 29. Which one of the following sequences of keys can be the result of an in-order traversal of the tree T?
   a) 9, 10, 15, 22, 23, 25, 27, 29, 40, 50, 60, 95
   b) 9, 10, 15, 22, 40, 50, 60, 95, 23, 25, 27, 29
   c) 29, 15, 9, 10, 25, 22, 23, 27, 40, 60, 50, 95
   d) More than one of the above
   e) None of the above

6. The in-order and pre-order traversal of a binary tree are d b e a f c g and a b d e c f g, respectively. Which one of the following is the post-order traversal of the binary tree?
   a) e d b g f c a
   b) e d b f g c a
   c) d e b f g c a
   d) More than one of the above
   e) None of the above

7. What is the possible number of binary trees that can be created with 3 nodes, giving the sequence N, M, L when traversed in post-order.
   a) 15
   b) 3
   c) 5
   d) More than one of the above
   e) None of the above

8. A binary search tree contains values 7, 8, 13, 26, 35, 40, 70, 75. Which one of the following is a valid post-order sequence of the tree provided the pre-order sequence as 35, 13, 7, 8, 26, 70, 40 and 75?
   a) 7, 8, 26, 13, 75, 40, 70, 35
   b) 26, 13, 7, 8, 70, 75, 40, 35
   c) 8, 7, 26, 13, 40, 75, 70, 35
   d) More than one of the above
   e) None of the above

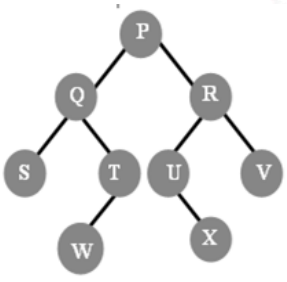
9. Which of the following pair's traversals on a binary tree can build the tree uniquely?
   a) post-order and pre-order
   b) post-order and in-order
   c) post-order and level order
   d) More than one of the above
   e) None of the above

10. A full binary tree can be generated using _____
   a) post-order and pre-order traversal
   b) pre-order traversal
   c) post-order traversal
   d) More than one of the above
   e) None of the above

11. The maximum number of nodes in a tree for which post-order and pre-order traversals may be equal is _____
   a) 3
   b) 1
   c) 2
   d) More than one of the above
   e) None of the above

12. The pre-order and in-order are traversals of a binary tree are T M L N P O Q and L M N T O P Q. Which of following is post-order traversal of the tree?
   a) L N M O Q P T
   b) N M O P O L T
   c) L M N O P Q T
   d) More than one of the above
   e) None of the above

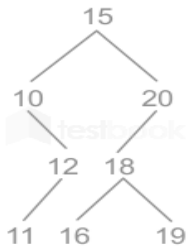
13. Find the postorder traversal of the binary tree shown below.



   a) P Q R S T U V W X
   b) W R S Q P V T U X
   c) S W T Q X U V R P
   d) More than one of the above
   e) None of the above

Solution with Explanation

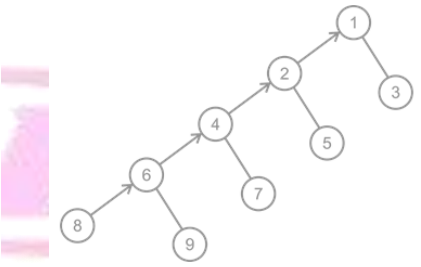
Answer1: B) 11, 12, 10, 16, 19, 18, 20, 15



Answer2: C) A, B, C, D, E, F, G, H, I

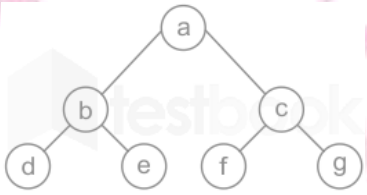
Answer3: C) 17

Answer4: B) 4

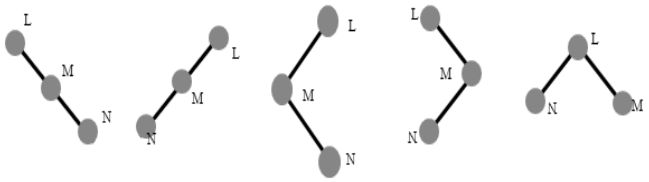


Answer5: A) 9, 10, 15, 22, 23, 25, 27, 29, 40, 50, 60, 95

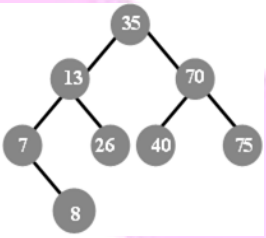
Answer6: C) d e b f g c a



Answer7: c) 5
Explanation: 5 binary trees are possible and they are,



Answer8: c) 8, 7, 26, 13, 40, 75, 70, 35
Explanation: The binary tree contains values 7, 8, 13, 26, 35, 40, 70, 75. The given pre-order sequence is 35, 13, 7, 8, 26, 70, 40 and 75. So, the binary search tree formed is



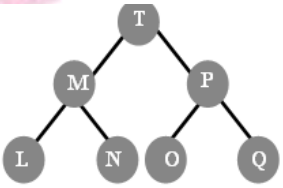
Thus post-order sequence for the tree is 8, 7, 26, 13, 40, 75, 70 and 35.

Answer9: b) post-order and in-order
Explanation: A binary tree can uniquely be created by post-order and in-order traversals.

Answer10: a) post-order and pre-order traversal
Explanation: Every node in a full binary tree has either 0 or 2 children. A binary tree can be generated by two traversals if one of them is in-order. But, we can generate a full binary tree using post-order and pre-order traversals.

Answer11: b) 1
Explanation: The tree with only one node has post-order and pre-order traversals equal.

Answer12: a) L N M O Q P T
Explanation: The tree generated by using given pre-order and in-order traversal is



Thus, L N M O Q P T will be the post-order traversal.

Answer13: c) S W T Q X U V R P
Explanation: In postorder traversal the left subtree is traversed first and then the right subtree and then the current node. So, the posturer traversal of the tree is, S W T Q X U V R P.