

MCQs

1. Consider the following operation performed on a stack of size 5.
Push(1);
Pop();
Push(2);
Push(3);
Pop();
Push(4);
Pop();
Pop();
Push(5);
After the completion of all operations, the number of elements present on stack are? (Medium)
(crs-be-programming)
 - a. 1 (correct)
 - b. 2
 - c. 3
 - d. 4
2. What is the maximum number of children that a binary tree node can have?(Easy) (crs-be-programming)
 - a. 1
 - b. 2 (correct)
 - c. 3
 - d. n
3. Which data structure uses Last In First Out(LIFO) method? (Easy) (crs-be-programming)
 - a. Queue
 - b. Stack (correct)
 - c. Binary Tree
 - d. HashTable
4. What method is used to remove an element from a Stack? (Easy) (crs-be-programming)
 - a. dequeue()
 - b. enqueue()
 - c. push()
 - d. pop() (correct)
5. What is the time complexity of searching an element in a queue in worst case? (Medium)
(crs-be-programming)
 - a. $O(1)$
 - b. $O(\log n)$
 - c. $O(n)$ (correct)
 - d. $O(n^2)$

6. Function calls use which data structure? (Easy) (crs-be-programming)

- a. Stack (correct)
- b. Queue
- c. Tree
- d. None of these

7. Which of the following is not a type of queue? (Medium)(crs-be-programming)

- a. Priority Queue
- b. Double ended queue
- c. Circular Queue
- d. None of the above (correct)

8. In recursion the condition after which the function will stop calling itself is? (easy) (crs-be-programming)

- a. Base condition (correct)
- b. Function call
- c. Both
- d. None

9. Suppose we go to buy a movie ticket, and there is a huge line of people to buy tickets, the person in front gets the ticket first and then the next person and so on. The line represents which data structure? (Medium) (crs-be-programming)

- a. Stack
- b. Array
- c. Queue (correct)
- d. Tree

10. Which of the following data structures can be used to implement a queue? (Medium) (crs-be-programming)

- a. Array
- b. LinkedList
- c. Both a and b (correct)
- d. None of the above

11. What is the time complexity for the below function? (Easy) (crs-be-programming)

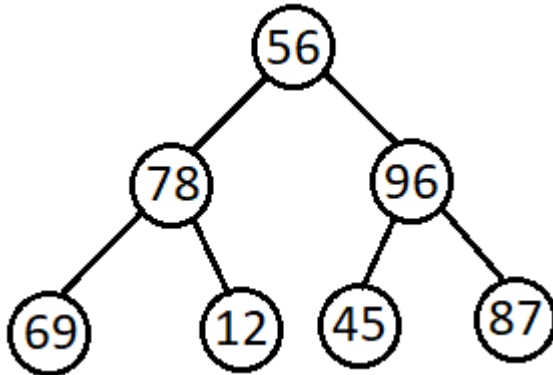
```
function sum(n){  
    if(n == 0) return 0;  
    return n + sum(n-1);  
}
```

- a. $O(n)$ (correct)
- b. $O(\log n)$
- c. $O(n^2)$
- d. $O(n \log n)$

12. Which of the below given sorting techniques has highest best-case runtime complexity?(easy)
(crs-be-programming)

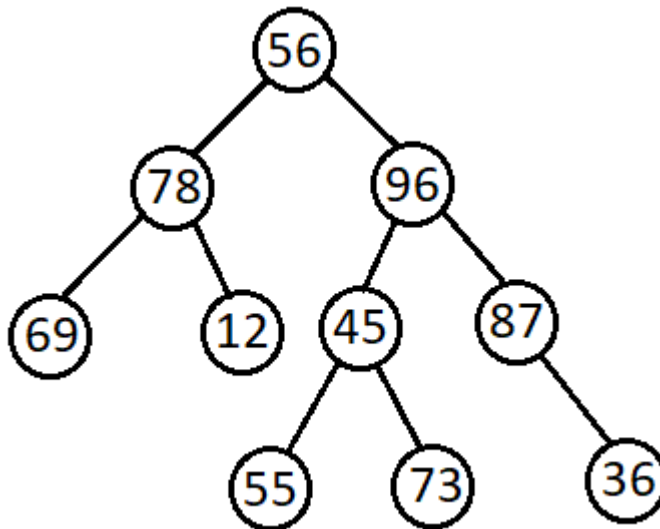
- a. quick sort
- b. selection sort (correct)
- c. insertion sort
- d. bubble sort

13. In the below tree, what are the leaf nodes? (Medium) (crs-be-programming)



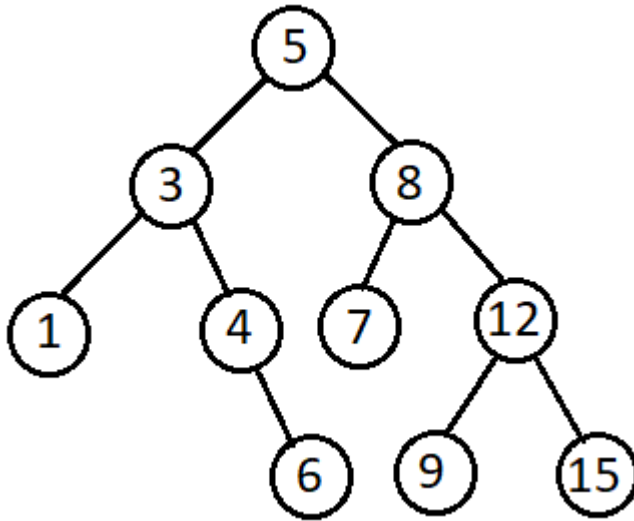
- a. 56
- b. 78 96
- c. 69 12
- d. 69 12 45 87 (correct)

14. In the below tree, which of the following nodes are the immediate children of node 96? (Easy)
(crs-be-programming)



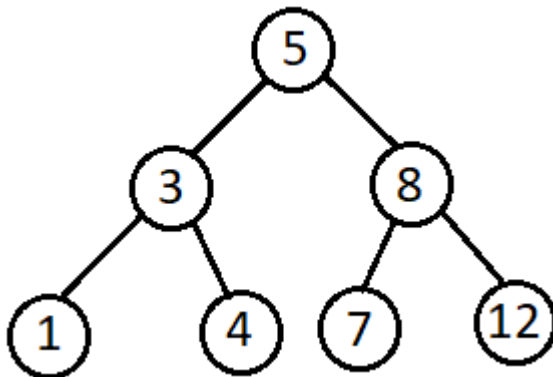
- a. 55 73 36
- b. 45 87 (correct)
- c. 45 55 73 87 36
- d. 56

15. Is the tree below a valid binary search tree?(Difficult) (crs-be-programming)



- a. Yes
- b. No (correct)
- c. May be
- d. Can't be said

16. Which of the following options represent the preorder traversal of the below tree? (Difficult) (crs-be-programming)



- a. 5 3 1 4 8 7 12 (correct)
- b. 1 3 4 5 7 8 12
- c. 12 8 7 5 4 3 1
- d. None of the above

17. Below is the algorithm to find if the given tree is a valid BST, is the algorithm correct, if not, why?(Difficult) (crs-be-programming)

```
isBST(node) {  
    if(node is null) return true;  
    if (node.left is not null && node.left.data > node.data)  
        return false;  
    if (node.right is not null && node.right.data < node.data)  
        return false;  
}
```

```

    return isBST(node.left) && isBST(node.right);
}

```

- Yes, it is valid
- No, it is a algorithm to check if tree is a valid binary tree and not BST
- No, it only checks for immediate children, but to check if tree is a valid BST, we need to make sure that every children in the left is smaller than the root node and similarly every children in the right is greater than the root node at each level of tree (correct)
- None of the above

18. Which of the following is incorrect about a binary search tree?(Medium) (crs-be-programming)

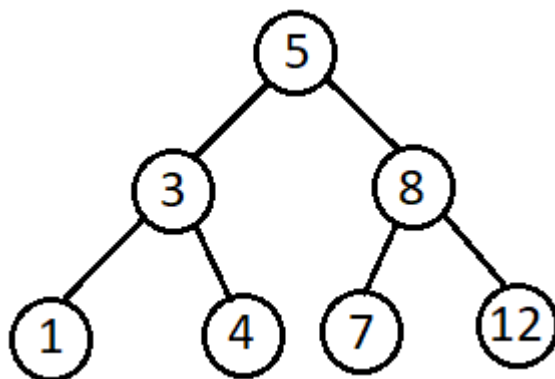
- The left child is always lesser than its parent
- The right child is always greater than its parent
- The left and right sub-trees should also be binary search trees
- In order sequence gives decreasing order of elements (correct)

19. Consider an implementation of unsorted doubly linked list. Suppose it has its representation with a head pointer only. Given the representation, which of the following operation can be implemented in $O(1)$ time? (Medium) (crs-be-programming)

- Insertion at the front of the linked list
- Insertion at the end of the linked list
- Deletion of the front node of the linked list
- Deletion of the last node of the linked list

- I and II
- I and III (correct)
- I, II and III
- All of the above options - I, II, III, IV

20. The below tree is which type of tree? (Medium) (crs-be-programming)



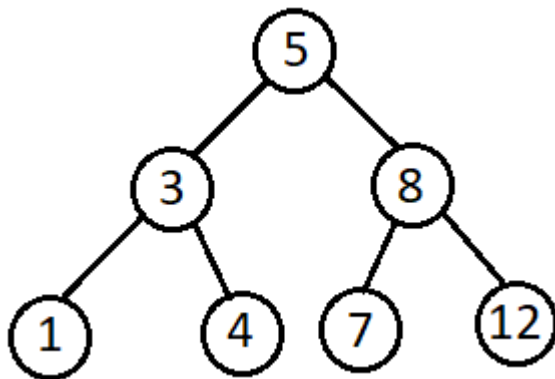
- Binary Search Tree (correct)
- Binary Expression Tree
- N-ary Tree
- None of the above

21. What will be the output of the below code snippet? (Medium) (crs-be-programming)

```
function print(int n)
{
  console.log(n/2);
  print(n/2);
}
print(10);
```

- a. 5 2 1 0
- b. 10 5 2 1 0
- c. Stack overflow error (correct)
- d. None of these

22. What is the value of the root node in the tree?(easy) (crs-be-programming)



- a. 5 (correct)
- b. 3
- c. 8
- d. 12

23. Which of the following types of tree, every node can have at most two children? (Easy)

(crs-be-programming)

- a. Binary Tree (correct)
- b. Ternary Tree
- c. N-ary Tree
- d. None of the above

24. The number of edges from the node to the deepest leaf is called _____ of the tree. (Easy)

(crs-be-programming)

- a. Height (correct)
- b. Depth
- c. Length
- d. Width

25. What is the worst case time complexity for finding the height of the binary tree? (Medium)

(crs-be-programming)

- a. $h = O(\log \log n)$
- b. $h = O(n \log n)$
- c. $h = O(n)$ (correct)
- d. $h = O(\log n)$

26. If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed? (medium) (crs-be-programming)

- a. ABCD (correct)
- b. DCBA
- c. DCAB
- d. ABDC

27. What is the term for inserting into a full queue known as? (medium) (crs-be-programming)

- a. Overflow (correct)
- b. Underflow
- c. Null Pointer Exception
- d. program won't be compiled

28. What is the space complexity of a linear queue having n elements? (easy) (crs-be-programming)

- a. $O(n)$ (correct)
- b. $O(n \log n)$
- c. $O(\log n)$
- d. $O(1)$

29. What is the term for deleting from empty stack known as? (medium) (crs-be-programming)

- a. Overflow
- b. Underflow (correct)
- c. Null Pointer Exception
- d. program won't be compiled

30. Consider an implementation of unsorted singly linked list. Suppose it has its representation with a head and tail pointer. Given the representation, which of the following operation can be implemented in $O(1)$ time? (Medium) (crs-be-programming)

- i) Insertion at the front of the linked list
- ii) Insertion at the end of the linked list
- iii) Deletion of the front node of the linked list
- iv) Deletion of the last node of the linked list

- a. I and II
- b. I and III
- c. I, II and III (correct)
- d. All of the above options - I, II, III, IV