قائمة الاسئلة

امتحان نهاية الفصل الدراسي الثاني - للعام الجامعي 1446 هـ - الموافق -2025/2024مـكلية الحاسوب وتكنولوجيا المعلومات :: هياكل البيانـ

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1) What is the time complexity of searching for an element in a binary search tree?
   1) - A) O(1)
   2) + B) O(log n)
   3) - C) O(n)
   4) - D) O(n log n)
2) The circular queue is considered full when:
   1) - Front == size
   2) - Rear == Front
   3) + Count == size
   4) - Rear == size - 1
3) What is the value of the postfix expression 4 5 6 * + 2 -?
   1) - 14
   2) - 20
   3) + 32
   4) - 18
4) The postfix form of the expression (M + N) * (P - Q) is?
   1) - +M N * P Q -
   2) - MN + PQ -
   3) + M N + P Q - *
   4) - +M N * -P Q
5) What is the time complexity of merging two sorted linked lists?
   1) - O(n log n)
   2) - O(1)
   3) + O(n)
   4) - O(log n)
6) The prefix form of the expression A + ((B / C) * (D - A)) is?.
   1) - A/ *^BC^-DAFH
   2) + + A * / B C - D A
   3) - + A /* B C - D A
   4) - + A * B -C * D A
7) What is the time complexity of display single linked list in reverse order?
   1) - O(nlogn)
   2) - O(1)
   3) + O(n)
   4) - O(logn)
8) The five items: A, B, C, D, and E are pushed in a stack, one after other starting from A. The stack is popped four items and each element is inserted in a queue. The two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is
   1) - C
   2) - E
   3) - A
   4) + D
9) In the worst case, the number of comparisons needed to find the duplicated nodes in a single linked list of length n is
   1) + N^2

2) - Logn
3) - n/2
4) - logn-1

10) Time complexity of given function q10.png is

$$f(N) = N \log N + N \log (N^2)$$

1) - O(N)
2) + O(N log N)
3) - O(log N)
4) - Answer9.png

11) Time complexity of given function f(N)= N+ log N + N/2 is
1) + O(N)
2) - O(N log N)
3) - O(log N)
4) - O (N/2)

12) which of the following data structure round robin algorithm used?
1) - Linear queue
2) + circle queue
3) - double ended queue
4) - None of the above

13) What is the information, which a linkedlists node must store?
1) - A)The address of the next node if it exists
2) - B)The value of current node
3) + c)Both(A) and (B)
4) - D)None of the above

14) Time complexity for following equation is q14.png

```
int f2(int N)
 {
int x = 0;
for (int i = 0; i < N; i++)
for (int j = 0; j < M; j++)
x++;
return x;
 }
```

1) + O(N*M)
2) - O(n)
3) - O(logn)
4) - None of the above

15) Time complexity of given function q21.png is

$$f(N) = (N^2 + N) / N$$

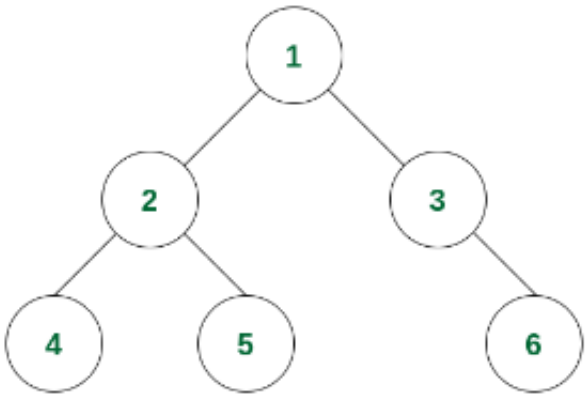
1) - O(1)
2) + O(n)
3) - N^2
4) - None of the above

16) Time complexity of given function q22.png is

```
for (int  i = 0; i < n + 100; ++i)
 {
for (int j = 0; j < i  ; j++)
{
sum = sum + j;
}
Cout<<sum<<endl;
 }
```

1) - O(1)
2) - O(n)
3) - N^2
4) + N^3

17) In the binary tree shown below, what is the pre-order traversal q17.png?



1) - 1-2-4-5-3-6
2) + 1-2-4-5-6-3
3) - 1-2-3-4-5-6
4) - None of the above

18) Time complexity of splitting linked list into two lists is

1) - O(1)
2) + O(n)
3) - O(n2)
4) - O(n2)+ O(n)

19) Which of the following is not a characteristic of a binary search tree?

1) - Each node has at most two children.
2) - The left child is less than the parent node.
3) - The right child is greater than the parent node.
4) + Nodes can have an arbitrary number of children.

20) Big O notation is a mathematical notation that describes the execution time of algorithm in it's

1) - Best Case
2) + Worst case
3) - Average case

4) - None

21) Suppose a Linear queue is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, REAR = FRONT = 0. The conditions to detect queue full and queue empty are:
1) - FULL: Rear=Size-1,empty:Front=0
2) - FULL:Rear=Size ,empty:Front=-1
3) - FULL: Rear=Size,empty:Front=-1
4) + FULL:Rear=Size ,empty:Front=0

22) Stack A has the entries a, b, c (with a on top). Stack B is empty. An entry popped out of stack A can be pushed to stack B. which of the following is the result of popped out from stack B?
1) + c,b,a
2) - a,b,c
3) - c,a,b
4) - None of the above

23) What is the worst-case time complexity of inserting n elements into the beginning of a linked list?
1) + O(N)
2) - O(Nlogn)
3) - O(N*N)
4) - O(1)

24) Which of the following is the advantage of the array data structure?
1) - Elements of mixed data type can be stored
2) + Easier to access the elements in an array
3) - Index of the first element starts from 1
4) - Elements of an array can’t be sorted

25) Which traversal method would you use to obtain the nodes of a binary tree in non-decreasing order?
1) - Pre-order
2) - Post-order
3) + In-order
4) - Level-order

26) Which of the following represents the Postorder Traversal of a Binary Tree?
1) + Left->Right->Root
2) - Left->Root->Right
3) - Right->Left->Root
4) - Right->Root->Left

27) Time complexity of Pushing a value on to a stack containing N values, implemented as a linked list
1) - O(log N)
2) - O(N)
3) + O(1)
4) - O(N log N)

28) Which data structure is required to convert the infix to prefix notation?
1) + Stack
2) - Linked list
3) - Binary tree
4) - Queue

29) In a stack, the top element can be accessed in O(1) time.
1) + TRUE.
2) - FALSE.

30) Execute the process in CPU is one of stack applications
1) - TRUE.

2) + FALSE.

31) The big oh for Poping N values onto a stack is O(N)
1) + TRUE.
2) - FALSE.

32) Tree, linked list are example of dynamic data structure
1) + TRUE.
2) - FALSE.

33) Array elements are normally stored contiguously in memory.
1) + TRUE.
2) - FALSE.

34) Most appropriate data structure to print a list of elements in reverse order is Queue data structure
1) - TRUE.
2) + FALSE.

35) Suppose the initial value of Top=0, then the stack is full if Top=size-1.
1) - TRUE.
2) + FALSE.