

ADS TEST

TIME--45min ,40 question



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Which of the following is the correct way to declare a multidimensional array 1 point in Java?

- ☐ a) int[] arr;
- ☐ b) int arr[][];
- ☒ c) int[][]arr;
- ☐ d) int [[]] arr;

Clear selection



In general, the index of the first element in an array is _____

1 point

- ☒ a) 0
- ☐ b) -1
- ☐ c) 2
- ☐ d) 1

Clear selection

Elements in an array are accessed _____

1 point

- ☐ a) randomly
- ☒ b) sequentially
- ☐ c) exponentially
- ☐ d) logarithmically

Clear selection



1 point

```
public class array
{
    public static void main(String args[])
    {
        int []arr = {1,2,3,4,5};
        System.out.println(arr[5]);
    }
}
```

- ☐ a) 4
- ☐ b) 5
- ☒ c) ArrayIndexOutOfBoundsException
- ☐ d) InavlidInputException

Clear selection



What is the time complexity of the following code?

1 point

```
public boolean isBalanced(String exp)
{
    int len = exp.length();
    Stack<Integer> stk = new Stack<Integer>();
    for(int i = 0; i < len; i++)
    {
        char ch = exp.charAt(i);
        if (ch == '(')
            stk.push(i);
        else if (ch == ')')
        {
            if(stk.peek() == null)
            {
                return false;
            }
            stk.pop();
        }
    }
    return true;
}
```

- ☐ a) $O(\log n)$
- ☒ b) $O(n)$
- ☐ c) $O(1)$
- ☐ d) $O(n \log n)$

Clear selection

In a stack, if a user tries to remove an element from an empty stack it is called _____

1 point

- ☒ a) Underflow
- ☐ b) Empty collection
- ☐ c) Overflow
- ☐ d) Garbage Collection

Clear selection



Entries in a stack are "ordered". What is the meaning of this statement?

1 point

- ☐ a) A collection of stacks is sortable
- ☐ b) Stack entries may be compared with the '<' operation
- ☐ c) The entries are stored in a linked list
- ☐ d) There is a Sequential entry that is one by one

Which of the following is not the application of stack?

1 point

- ☐ a) A parentheses balancing program
- ☐ b) Tracking of local variables at run time
- ☐ c) Compiler Syntax Analyzer
- ☐ d) Data Transfer between two asynchronous process

What is the value of the postfix expression 6 3 2 4 + - *?

1 point

- ☐ a) 1
- ☐ b) 40
- ☐ c) 74
- ☐ d) -18

The postfix form of the expression $(A + B) * (C * D - E) * F / G$ is?

1 point

- ☐ a) $AB + CD * E - FG / **$
- ☐ b) $AB + CD * E - F **G /$
- ☐ c) $AB + CD * E - *F *G /$
- ☐ d) $AB + CDE * - * F *G /$



What data structure would you mostly likely see in non recursive implementation of a recursive algorithm?

1 point

- ☐ a) Linked List
- ☐ b) Stack
- ☐ c) Queue
- ☐ d) Tree

. The prefix form of $A-B / (C * D ^ E)$ is?

1 point

- ☐ a) $- / ^ * A C B D E$
- ☐ b) $- A B C D ^ * D E$
- ☐ c) $- A / B ^ * C ^ D E$
- ☐ d) $- A / B C ^ * D E$

The prefix form of an infix expression $(p + q) - (r * t)$ is?

1 point

- ☐ a) $+ p q - * r t$
- ☐ b) $- + p q r * t$
- ☐ c) $- + p q * r t$
- ☐ d) $- + * p q r t$



The data structure required for Breadth First Traversal on a graph is?

1 point

- ☐ a) Stack
- ☐ b) Array
- ☐ c) Queue
- ☐ d) Tree

Circular Queue is also known as _____

1 point

- ☐ a) Ring Buffer
- ☐ b) Square Buffer
- ☐ c) Rectangle Buffer
- ☐ d) Curve Buffer

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? 1 point

- ☐ a) ABCD
- ☐ b) DCBA
- ☐ c) DCAB
- ☐ d) ABDC



A data structure in which elements can be inserted or deleted at/from both ends but not in the middle is? 1 point

- ☐ a) Queue
- ☐ b) Circular queue
- ☐ c) Dequeue
- ☐ d) Priority queue

A normal queue, if implemented using an array of size MAX_SIZE, gets full when? 1 point

- ☐ a) $\text{Rear} = \text{MAX_SIZE} - 1$
- ☐ b) $\text{Front} = (\text{rear} + 1) \bmod \text{MAX_SIZE}$
- ☐ c) $\text{Front} = \text{rear} + 1$
- ☐ d) $\text{Rear} = \text{front}$

A linear collection of data elements where the linear node is given by means of pointer is called? 1 point

- ☐ a) Linked list
- ☐ b) Node list
- ☐ c) Primitive list
- ☐ d) Unordered list



In linked list each node contains a minimum of two fields. One field is data field to store the data second field is? 1 point

- ☐ a) Pointer to character
- ☐ b) Pointer to integer
- ☐ c) Pointer to node
- ☐ d) Node

What would be the asymptotic time complexity to add a node at the end of singly linked list, if the pointer is initially pointing to the head of the list? 1 point

- ☐ a) $O(1)$
- ☐ b) $O(n)$
- ☐ c) $\theta(n)$
- ☐ d) $\theta(1)$

. What would be the asymptotic time complexity to find an element in the linked list? 1 point

- ☐ a) $O(1)$
- ☐ b) $O(n)$
- ☐ c) $O(n^2)$
- ☐ d) $O(n^4)$



Linked lists are not suitable for the implementation of _____

1 point

- ☐ a) Insertion sort
- ☐ b) Radix sort
- ☐ c) Polynomial manipulation
- ☐ d) Binary search

Which of the following code is used to create new node?

1 point

```
struct node
{
    int data;
    struct node * next;
}
typedef struct node NODE;
NODE *ptr;
```

- ☐ a) ptr = (NODE*)malloc(sizeof(NODE));
- ☐ b) ptr = (NODE*)malloc(NODE);
- ☐ c) ptr = (NODE*)malloc(sizeof(NODE*));
- ☐ d) ptr = (NODE)malloc(sizeof(NODE));

Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?

1 point

- ☐ a) Insertion Sort
- ☐ b) Quick Sort
- ☐ c) Heap Sort
- ☐ d) Merge Sort



In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is?

1 point

- ☐ a) $\log_2 n$
- ☐ b) $n/2$
- ☐ c) $\log_2 n - 1$
- ☐ d) n

You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?

1 point

- ☐ a) Delete the first element
- ☐ b) Insert a new element as a first element
- ☐ c) Delete the last element of the list
- ☐ d) Add a new element at the end of the list

How do you calculate the pointer difference in a memory efficient double linked list?

1 point

- ☐ a) head xor tail
- ☐ b) pointer to previous node xor pointer to next node
- ☐ c) pointer to previous node – pointer to next node
- ☐ d) pointer to next node – pointer to previous node



1 point

What is the functionality of the following piece of code?

```
public int function()  
{  
    Node temp = tail.getPrev();  
    tail.setPrev(temp.getPrev());  
    temp.getPrev().setNext(tail);  
    size--;  
    return temp.getItem();  
}
```

- ☐ a) Return the element at the tail of the list but do not remove it
- ☐ b) Return the element at the tail of the list and remove it from the list
- ☐ c) Return the last but one element from the list but do not remove it
- ☐ d) Return the last but one element at the tail of the list and remove it from the list

The optimal data structure used to solve Tower of Hanoi is _____

1 point

- ☐ a) Tree
- ☐ b) Heap
- ☐ c) Priority queue
- ☐ d) Stack

Which among the following is not a palindrome?

1 point

- ☐ a) Madam
- ☐ b) Dad
- ☐ c) Malayalam
- ☐ d) Maadam



How many children does a binary tree have?

0 points

- ☐ a) 2
- ☐ b) any number of children
- ☐ c) 0 or 1 or 2
- ☐ d) 0 or 1

What is/are the disadvantages of implementing tree using normal arrays?

1 point

- ☐ a) difficulty in knowing children nodes of a node
- ☐ b) difficult in finding the parent of a node
- ☐ c) have to know the maximum number of nodes possible before creation of trees
- ☐ d) difficult to implement

Can a tree stored in an array using either one of inorder or post order or pre order traversals be again reformed?

1 point

- ☐ a) Yes just traverse through the array and form the tree
- ☐ b) No we need one more traversal to form a tree
- ☐ c) No in case of sparse trees
- ☐ d) Yes by using both inorder and array elements



Disadvantages of linked list representation of binary trees over arrays?

1 point

- ☐ a) Randomly accessing is not possible
- ☐ b) Extra memory for a pointer is needed with every element in the list
- ☐ c) Difficulty in deletion
- ☐ d) Random access is not possible and extra memory with every element

Which of the following traversing algorithm is not used to traverse in a tree?

1 point

- ☐ a) Post order
- ☐ b) Pre order
- ☐ c) Post order
- ☐ d) Randomized

Level order traversal of a tree is formed with the help of

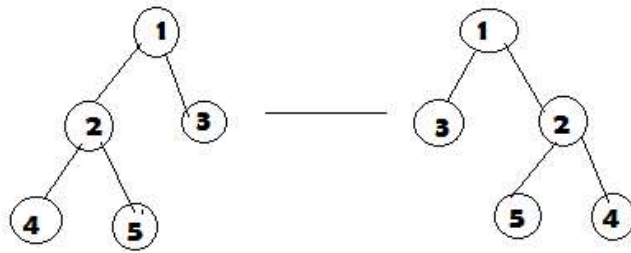
1 point

- ☐ a) breadth first search
- ☐ b) depth first search
- ☐ c) dijkstra's algorithm
- ☐ d) prims algorithm



1 point

9. What must be the missing logic below so as to print mirror of a tree as below as an example?



```
if(rootnode):
    mirror(rootnode-->left)
    mirror(rootnode-->right)

    //missing

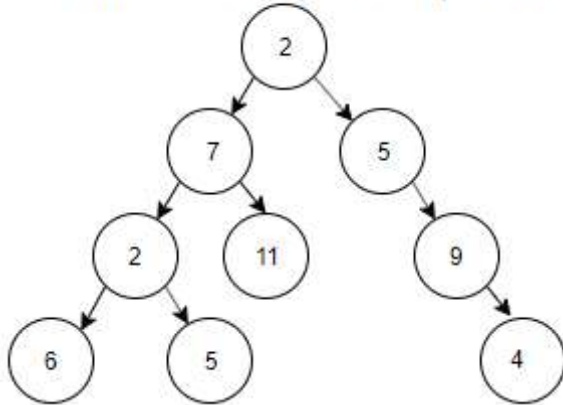
end
```

- ☐ a) swapping of left and right nodes is missing
- ☐ b) swapping of left with root nodes is missing
- ☐ c) swapping of right with root nodes is missing
- ☐ d) nothing is missing



1 point

1. For the tree below, write the pre-order traversal.



- ☐ a) 2, 7, 2, 6, 5, 11, 5, 9, 4
- ☐ b) 2, 7, 5, 2, 6, 9, 5, 11, 4
- ☐ c) 2, 5, 11, 6, 7, 4, 9, 5, 2
- ☐ d) 2, 7, 5, 6, 11, 2, 5, 4, 9

What is the time complexity of pre-order traversal in the iterative fashion?

1 point

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

To obtain a prefix expression, which of the tree traversals is used?

1 point

- ☐ a) Level-order traversal
- ☐ b) Pre-order traversal
- ☐ c) Post-order traversal
- ☐ d) In-order traversal

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