ADS TEST

Total points 28/40

TIME--45min ,40 question

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CENTRE *

KHARGHAR

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

- a) int[] arr;
- b) int arr[[]];
- c) int[][]arr; ✓
- d) int[[]] arr;

✓ In general, the index of the first element in an array is _____ 1/1

- (●) a) 0 ✓
- ( ) b) -1
- ( ) c) 2
- ( ) d) 1

✗ Elements in an array are accessed _____ 0/1

- ( ) a) randomly
- (●) b) sequentially ✗
- ( ) c) exponentially
- ( ) d) logarithmically

Correct answer

- (●) a) randomly

✓ 1/1

```
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

✓ What is the time complexity of the following code? 1/1

```
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(logn)
- b) O(n) ✓
- c) O(1)
- d) O(nlogn)

✓ In a stack, if a user tries to remove an element from an empty stack it is called _____ 1/1

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

✗ Entries in a stack are “ordered”. What is the meaning of this statement? 0/1

- 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

Correct answer

- d) There is a Sequential entry that is one by one

✓ Which of the following is not the application of stack? 1/1

- 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 + – *? 1/1

- a) 1
- b) 40
- c) 74
- d) -18 ✓

✓ The postfix form of the expression (A+ B)*(C*D- E)*F / G is? 1/1

- 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? 1/1

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

✓ . The prefix form of A-B/ (C * D ^ E) is? 1/1

- a) -/*^ACBDE
- b) -ABCD*^DE
- c) -A/B*C^DE ✓
- d) -A/BC*^DE

✓ The prefix form of an infix expression (p + q) – (r * t) is? 1/1

- a) + pq – *rt
- b) – +pqr * t
- c) – +pq * rt ✓
- d) – + * pqrt

✗ The data structure required for Breadth First Traversal on a graph is? 0/1

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

Correct answer

- c) Queue

✓ Circular Queue is also known as _____ 1/1

- 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? 1/1

- (●) 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? 1/1

- ( ) 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? 0/1

- ( ) a) Rear = MAX_SIZE – 1
- (●) b) Front = (rear + 1)mod MAX_SIZE ✗
- ( ) c) Front = rear + 1
- ( ) d) Rear = front

Correct answer

- (●) a) Rear = MAX_SIZE – 1

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

- (●) 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? 1/1

- ( ) 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? 0/1

- ( ) a) O(1)
- (●) b) O(n) ✗
- ( ) c) θ(n)
- ( ) d) θ(1)

Correct answer

- (●) c) θ(n)

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

- a) O(1)
- b) O(n) ✓
- c) O(n2)
- d) O(n4)

✗ Linked lists are not suitable for the implementation of _____ 0/1

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

Correct answer

- d) Binary search

✗ Which of the following code is used to create new node? 0/1

```
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));

Correct answer

- a) ptr = (NODE*)malloc(sizeof(NODE));

✗ Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity? 0/1

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

Correct answer

- 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? 1/1

- 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? 0/1

- 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 ✗

Correct answer

- c) Delete the last element of the list

✗ How do you calculate the pointer difference in a memory efficient double linked list? 0/1

- 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 ✗

Correct answer

- b) pointer to previous node xor pointer to next node

✓ 1/1

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 _____ 1/1

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

✓ Which among the following is not a palindrome? 1/1

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

✓ How many children does a binary tree have?

- 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? 0/1

- 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 ✗

Correct answer

- c) have to know the maximum number of nodes possible before creation of trees

✗ Can a tree stored in an array using either one of inorder or post order or pre order traversals be again reformed? 0/1

- 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 ✗

Correct answer

- b) No we need one more traversal to form a tree

✓ Disadvantages of linked list representation of binary trees over arrays? 1/1

- 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? 1/1

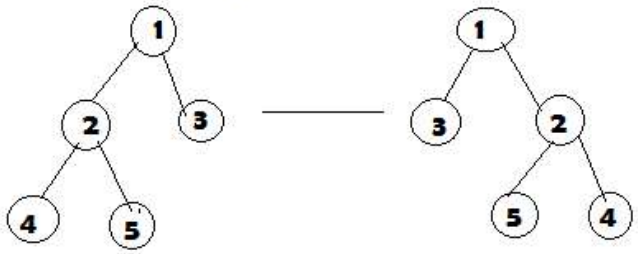
- a) Post order
- b) Pre order
- c) Post order
- d) Randomized ✓

✓ Level order traversal of a tree is formed with the help of 1/1

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

✓ 1/1

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

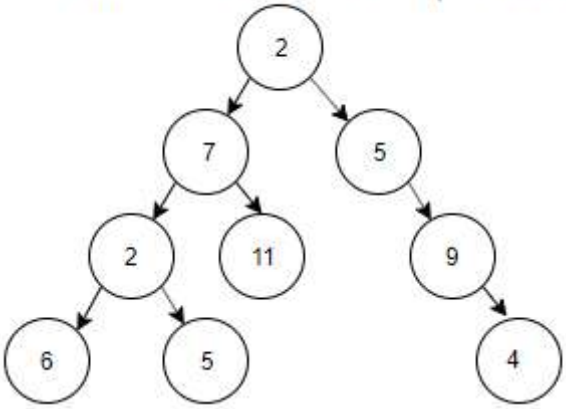



```
if(rootnode):
  mirror(rootnode-->left)
  mirror(rootnode-->right)

  //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

✓ 1/1

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? 1/1

- ( ) a) O(1)
- (●) b) O(n) ✓
- ( ) c) O(logn)
- ( ) d) O(nlogn)

✓ To obtain a prefix expression, which of the tree traversals is used? 1/1

- ○ a) Level-order traversal
- ◉ b) Pre-order traversal ✓
- ○ c) Post-order traversal
- ○ d) In-order traversal