D 72942 (Pages : 2) Name.....

Reg. No.....

FIRST SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION DECEMBER 2019

(CBCSS)

Computer Science

CSS 1C 02—ADVANCED DATA STRUCTURES

(2019 Admissions)

Time : Three Hours Maximum : 30 Weightage

Section A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. Explain time complexity by taking the following example :

```
for (i = 1 ; i < = n ; i++)
    for (j = 1 ; j < = n ; j++)
        b [i] [j] = a [j] [i] ;
```

2. Explain the working of Binary Search.
3. Explain the implementation of circular queue using Linked List.
4. What is Tries ? Give example.
5. Illustrate with example how a directed graph can be represented with adjacency matrix.
6. Briefly explain the process of rehashing.
7. Explain "Deaps" and "Splay trees".

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. What is ADT ? What is its significance ? Write and explain any *one* ADT.
9. Write functions :
   (i) To delete alternate nodes from a linear singly linked list.
   (ii) To insert a new node as nth node (if number of nodes in the list is less than n, insert the node as the last node).
   (iii) Delete the first node of a circular singly linked list.

Turn over

10. Write a function to evaluate postfix expressions. Write your assumptions. Use stack implemented with linked list.

11. Write a function to insert a new value to a Binary Search Tree.

12. With suitable example, explain Red-black tree. Compare Red-Black tree with Binary Search Tree.

13. Explain linear probing and quadratic probing with suitable example.

14. Discuss amortized analysis.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Write necessary functions for linked list implementation of (i) Queue ; (ii) Priority Queue ; and (iii) Deque.

16. Explain with suitable examples (i) Deterministic skip lists ; (ii) Sparse matrix representation.

17. Write functions for (i) Searching B+ Tree ; (ii) Depth First Search of a graph.

18. Discuss implementation of Min-Max heaps with suitable examples.

(2 × 5 = 10 weightage)