D 93002 **(Pages : 2)** **Name**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2015

(CUCSS)

Computer Science

CSS 1C 02 – ADVANCED DATA STRUCTURE

(2014 Admission onwards)

Time : Three Hours **Maximum** : 36 Weightage

Part A

Answer **all** *questions.*

Each question carries 1 weightage.

1. What is Big (0) notation ?
2. What is meant by the term ADT ?
3. What is polynomial list ?
4. Evaluate the expression. 7 5 2 + * 4 1 5 /
5. Define (a) complete binary tree (b) Depth of a tree.
6. What are the advantages of doubly linked list ?
7. Write recursive algorithm for pre order traversal.
8. Compare complexity of linear and binary search.
9. What are the advantages of BST ?
10. Define hash table ?
11. What is binomial queue ?
12. What is skew heap ?

(12 x 1 = 12 weightage)

Part B

Answer any **six** *questions.*

Each question carries 2 weightage.

13. Derive the time complexity of matrix multiplication.
14. Write an algorithm to delete a node at the end of singly **linked list.**
15. Explain sparse matrix representation.

Turn over

16. Explain bubble sort. What is its average complexity ?

17. Find preorder and postorder of the following expression tree.
((P + ((Q ^ R) – S)) * (T – (U / V)))

18. Explain basic operation of stack using linked list.

19. Define priority queue. Explain linked list representation of priority queue.

20. Differentiate m-way search tree and binary search tree.

21. Explain double hashing.

(6 x 2 = 12 weightage)

Part C

Answer any **three** *questions.*
Each question carries **4** *weightage.*

22. Briefly describe the notions of

(a) The complexity of an algorithm and space-time tradeoff.

(b) Explain linear and non linear data structures with example.

23. (a) Write an algorithm to implement insertion and deletion in circular queue.

(b) Explain representation of tree in memory.

24. (a) Explain Huffman algorithm.

(b) P, Q, R, S, T, U, V, W are 8 external nodes whose weights are given as below. Construct a Huffman tree.

P	Q	R	S	T	U	V	W
12	6	7	9	3	7	15	6

25. Write notes on

(a) Graph Representation.

(b) Threaded binary tree.

(c) Sparse matrix representation.

26. Explain different types of hashing and collision resolution techniques with examples.

27. Develop an algorithm to implement binary heap. Validate the algorithm with suitable example.

(3 x 4 = 12 weightage)