FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2015

(CUCSS)

Computer Science

CSC 1C 02—ADVANCED DATA STRUCTURES

(2010-2013 Admissions)

Maximum : 36 Weightage

Time : Three Hours

Part A

Answer **all** *questions.*
Each question carries 1 weightage.

1. Define tree and binary tree.
2. Give an example showing how a graph can be represented with adjacency matrix.

3. Write any *one* advantage and one limitation of doubly linked lists.

4. Define skip lists.

5. Define generalized list.

6. Define hashing.

7. Explain advantages of hashing.

8. What is a B-tree ?

9. What is a kd tree ?

10. Give a suitable example for AA tree.

11. Define Min-Max heap.

12. What is a deap ?

(12 x **1** = 12 weightage)

Part B

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

13. Explain in detail any *one* application of stack.

14. Write a function to create a singly linked list of n integers. Write a function to search the list for a given key *k.* Comment on the complexity of your search algorithm.

15. Write a function to delete a list recursively.

16. Write note on shared list.

Turn over

17. Explain any *two* hashing functions.

18. Explain representation and search of a Red-black tree.

19. Write notes on 2-3 trees and 2-3-4 trees.

20. Explain Amortized Analysis.

21. Write note on leftist heap.

(6 x 2 = 12 weightage)

Part C

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

22. (i) Write a non-recursive function for in order tree traversal.

    (ii) Explain the array representation of sparse matrix.

23. (i) Explain representation of generalized list.

    (ii) Write and explain recursive algorithm for copying a list.

24. Discuss open addressing and chaining with suitable examples.

25. Explain double hashing and rehashing with suitable examples.

26. (i) Discuss insertion to a red-Black tree.

    (ii) Write note on splay rotation.

27. (i) What is a pairing heap ? Give an example of Min-pairing heap. Explain melding.

    (ii) Write notes on binomial queues.

(3 x 4 = 12 weightage)