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FIRST SEMESTER M.Sc. DEGREE EXAMINATION, JANUARY 2012

Computer Science

CSC 1C 02—ADVANCED DATA STRUCTURES

(2010 **admissions**)

Time : Three Hours

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Maximum Weightage : 36

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Part A

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

1. Write a recursive function for **inorder** traversal of a binary tree.

2. Give an example showing how a graph can be represented with adjacency list.

3. Write a function to count the number of nodes in a singly linked list.

4. Define skip list.

5. Explain the purpose of reference count in generalized lists.

6. Explain the need for rehashing.

7. Differentiate between static and dynamic hashing.

8. Define Red black tree.

9. Define splay trees.

10. What is a **trie ?**

11. What is a **deap ?**

12. Define leftist heap.

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

Part B

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

13. Explain any one application of Queue.

14. Write an algorithm for depth first search of a graph.

15. With suitable example, explain the representation of generalized list.

16. Write note on shared list.

17. Explain any *two* hashing functions.

18. What is an AA tree **?** Explain the application of AA tree.

Turn over

19. With suitable example, explain B-tree.

20. Explain insertion into a binomial heap.

21. Write notes on skew heap.

(6 x 2 = 12 weighta

Part C

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

22. (a) Write a function to reverse a singly linked list.

   (b) Explain the sequential (array) representation of a binary tree.

23. (a) Write and explain a function to compute the depth of a list.

   (b) Write note on heterogenous list.

24. Write notes on :

     (a) Open addressing.

     (b) Linear probing.

     (c) Double hashing.

25. (a) Explain chaining with example.

   (b) Explain structure of a hash table. Explain the process of hashing with suitable example.

26. (a) Discuss deletion from a Red black tree.

   (b) Compare kd trees and kd tries.

27. (a) What is a Fibonacci heap ? What are the steps in deleting an arbitrary node from an F-heap ?

   (b) Explain insertion into a Min-max heap.

(3 x 4 = 12 weightage)