D 22947

Name.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, JANUARY 2012

Computer Science

CS 102—ADVANCED DATA STRUCTURES

(2005 admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **any five** *questions.*

1. What is a circular list ? Explain the basic operations on this.
2. Define a structure to represent node in a skip list. Write constructor for skip list.
3. Explain methods to represent a graph in memory with examples.
4. Illustrate linear probing method in hashing.
5. What is a trie ? Explain its use with a suitable example.
6. State conditions under which insertion of a vertex in a Red-Black tree will result in a sequence of recolouring **steps.**
7. Explain binomial queues.

(5 x 8 = 40 marks)

Part B

Answer any **four** *questions.*

8. Write a C++ program to evaluate a postfix expression. Use a suitable data structure.
9. Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(x) = x \pmod{10}$. Show the resulting open addressing hash table using linear and quadratic probing.
10. Define AA tree. Explain skew and split procedures.
11. Give an example of a 2-d tree. Explain the insertion process in a 2-d tree.
12. Prove that rank of any node in a Fibonacci heap is 0 (log N).
13. What is amortized analysis ? Explain.

(4 x 10 = 40 marks)