PART B — (5 × 16 = 80 marks)

11. (a) (i) What characteristics should a good algorithm possess? (4)

   (ii) Analyse the time and space complexity for recursive binary search algorithm. (12)

Or

   (b) (i) Design Markov models

   (1) to recognize a palindrome

   (2) to count the number of occurrences of a character. (10)

   (ii) Explain how fixed and variable length strings are represented in memory. (6)

12. (a) (i) With an example, explain infix to postfix conversion and infix to prefix algorithms. (10)

   (ii) Describe in detail the array implementation of queues. (6)

Or

   (b) (i) Write an algorithm to count the number of occurrences of a data in a circular linked list and also delete all the duplicates present in the list. (10)

   (ii) Discuss in detail the representation of an associative list. (6)

13. (a) (i) Write a recursive algorithm to determine the following :

   • The number of nodes in a binary tree

   • The sum of the contents of all the nodes in the binary tree

   • The depth of the binary tree. (12)

   (ii) Explain with an example the various storage representations of graphs. (4)

Or

   (b) (i) Explain the garbage collection and compaction algorithms in detail. (10)

   (ii) Explain topological sort with suitable example. (6)

14. (a) (i) Trace the given input sequence using selection sort showing the intermediate steps. 12, 21, 10, 89, 199, 32, 67, 89. (8)

     (ii) Write notes on open addressing and chaining. (8)

Or

   (b) (i) Explain the structure of dynamic hashing. (10)

     (ii) With an example explain the following hashing functions

        * Mid-square method

        * Folding method

        * Digit Analysis. (6)

15. (a) (i) Explain the structure of indexed sequential file. (10)

     (ii) Write notes on direct files. (6)

Or

   (b) (i) Discuss in detail virtual hashing. (10)

     (ii) Explain how address translation for segmented paging is done in virtual memory system? (6)

Reg. No. :

L 1384

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Third Semester

Information Technology

IF 246 — DATA STRUCTURES AND ALGORITHMS

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define Data structures. List the various types of data structures.

2.   List the operations performed on strings.

3.   State any two applications of stacks and queues.

4.   Discuss how deletions are carried out in priority queue?

5.   Define (a) Indegree (b) Outdegree of a spanning tree.

6.   Write short notes on internal fragmentation.

7.   What is the run time efficiency of quicksort?

8.   What is linear probing?

9.   What is virtual memory?

10. How are key sequenced VSAM files processed?