BACHELOR IN COMPUTER APPLICATIONS

Term-End Examination

June, 2008

CS-62 : 'C' PROGRAMMING AND DATA STRUCTURE

Time : 2 hours *Maximum Marks : 60*

Note : *Question number 1 is **compulsory**. Answer any **three** questions from the rest. All algorithms should be written nearer to 'C' language.*

1. (a) What is sparse matrix ? Discuss methods of representation of sparse matrix in memory. Explain row-major and column-major order with example. 9

(b) What is a binary search tree ? Write an algorithm to find an element in a binary search tree. 5

(c) Define a circular queue. What is the condition that a circular queue is full (if queue is implemented using array) ? Write an algorithm for inserting a node at given location in a circular queue. 8

(d) Differentiate between internal and external sorting. Which sorting algorithm is preferred for external sorting ? Write an algorithm for K-way merge sort. 2+1+5=8

2. (a) Write a program in C for binary search tree. 5

(b) Apply Binary search for elements in array P to find the element 40, 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99. 3

(c) What are the various disadvantages of sequential file organisation ? 2

3. (a) Convert the following postfix expression into infix using stack : 3

A B C * D E F ↑ / G * – H * +

(b) What is AVL tree ? Construct an AVL search tree by inserting the following elements in order of their occurrence. (Show each of the rotations). 2+5=7

64, 1, 44, 26, 13, 110, 98, 85

4. Write short notes on the following : 5×2=10

(i) Directed graph

(ii) Compaction

(iii) Complete binary tree

(iv) Hash function

(v) Height balanced tree

5. (a) Write a program in C for bubble sort. 5

(b) Explain indexed-sequential file organisation. Under what conditions is it advantageous to have file organised as indexed-sequential rather than direct file ? 5