

ALCCS - (NEW SCHEME)

Code: CT11
Time: 3 Hours

Subject: DATA STRUCTURE THROUGH C
Max. Marks: 100

MARCH 2011

NOTE:

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
- Parts of a question should be answered at the same place.

Q.1 (7 × 4 = 28)

- Write a C program to delete an element from a queue using array.
- Describe Unions used in C. How is it different from structure?
- What do the following statement signify?
*FILE *fopen(const char *path, const char *mode);*
*FILE *freopen(const char *path, const char *mode, FILE *fp);*
- Discuss the time complexity of Quick sort in average and worst cases.
- Write a C recursive program to reverse a linked list.
- Write a C program that modifies pointer itself.
- Discuss topological sort, with an example.

Q.2 (9)

- Discuss postorder traversal and write its C program.
- Sort the following using Quick sort
5, 9, 7, 1, 6, 2, 3, 10, 4, 8 (9)

Q.3 (12)

- How can a sparse matrix be represented using linked list? Write a C program for transposing a sparse matrix.
- Discuss difference between arrays and lists. (6)

Q.4 (12)

- What are various operations that can be performed on stacks? Write a C program to solve Tower of Hanoi problem using stacks.
- Evaluate the expression $A/B * C * D + E - G$ by converting prefix form. (6)

Q.5 (12)

- Write C program for shortest path using Dijkstra's algorithm.
- Write C program for Radix sort and discuss its time complexity. (6)

- Q.6** a. Discuss B-tree and write C program for inserting and deleting nodes in B-tree. (12)
b. Write C program for Depth first search algorithm. (6)
- Q.7** a. Discuss Height balanced trees. (9)
b. Write C functions for implementing Queues using linked lists. (9)

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