(Please write your Exam Roll No.)   Exam Roll No. 01250404415

END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY - JUNE 2016

Paper Code: MCA102	Subject: Data & File Structure
Time: 3 Hours	Maximum Marks: 75

Note: Attempt any five questions including Q no.1 which is compulsory.

Q1 (a) Compute the time complexity of the following code segment written in C. **(5x5=25)**

....

for (j=1;j<n, j = K*j) Statement 1;

....

Assuming that n is size of input data and K is a constant.

(b) Implement multistacks using on 1D array. Write algorithms for push and pop operation in the ith stack.

(c) Write a c function that detects a circle within a linear linked list.

(d) Prove that for any non empty binary tree T, if n_0 is the number of leaf nodes and n_1 is the number of nodes of degree 2, then $n_0 = n_1 + 1$.

(e) Prove that the sum of the degrees of the vertices of an undirected graph is twice the number of edges.

Q2 (a) Write a C function to evaluate a postfix expression. **(6.5)**

(b) What do you mean by a sparse matrix? Write procedure to add two sparse matrices. **(6)**

Q3 (a) Write C functions to delete and add a node in a doubly linked list **(6.5)**

(b) How is a circular queue advantageous over a queue linear? Explain the addition and deletion operations in it. **(6)**

Q4 (a) How AVL tree is useful over a binary search tree? Insert following nodes with key values 10, 20, 30, 42, 28, 29, 50 in the order of their existence. **(6.5)**

(b) What is a threaded binary tree? Write a C function to delete a node from this tree. **(6)**

Q5 Explain various techniques of a graph representation. Describe Floyd Warshall's algorithm with suitable example. **(12.5)**

Q6 (a) Explain Kruskal's algorithm of minimum spanning tree with suitable example. **(6.5)**

(b) What do you mean by a binary search tree? Write procedures for various traversals of this tree. **(6)**

Q7 (a) Explain with suitable example the radix sort and compute its time complexity. **(6.5)**

(b) What do you mean by sequential file organization? Explain its advantages and disadvantages. **(6)**

Q8 (a) What is B+ tree indexing? Explain with suitable example. **(6.5)**

(b) Explain different collision resolution techniques in hashing. **(6)**

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