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

END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY- JUNE 2013

Paper Code: MCA 102 ***Subject: Data & File Structures (New)***

Time: 3 Hours ***Maximum Marks: 60***

Note: Attempt five questions including Q. No. 1 which is compulsory. Select one question from each unit.

Q1 Attempt any ten of the following briefly: [2x10]

a) Which operation works faster with a linked list as compared to an array? Why?
b) When does *Queue Underflow Exceptional Condition* arise and how can it be avoided?
c) Name a linear data structure that allows insertion and deletion on only one end. Also state its two uses.
d) In an expression tree, what is evaluated first, the leaf nodes or the internal nodes?
e) Give definition for the *struct Stack* that can be used for non-recursive in-order traversal of a tree.
f) What is the worst case time complexity of searching a node in a BST? Draw a sample tree that leads to this case.
g) State and explain an advantage of a B+ tree over a B tree.
h) Which data structure would you use for DFS traversal of a graph? What about BFS?
i) Which internal sorting algorithm would you use in case the input is almost sorted? Why?
j) What is critical path in a graph? What is its significance?
k) What is the average time complexity of insert operation and search operation in a Hash table?
l) Which sorting algorithm is used for external sorting? Why?
m) How is parity used for error control?

Unit – I

Q2.

a) Write a C program to create a linked list as a copy of an existing linked list. [6]
b) Compare the advantages and disadvantages of representing polynomials using linked lists and arrays respectively? [4]

Q3.

a) Write C functions to implement a stack. Also write a function that uses your stack to reverse a string. [7]

b) How would you ensure enqueue and dequeue operations on a linked queue, are performed in O (1)? Explain. [3]

P.T.O

Unit – II

Q4

a) Write a function to clone a binary search tree. [5]

b) Demonstrate (construct the tree and show the links and threads) threading for a right-in-threaded tree built using the input 12, 3, 23, 4, 2, 21 [5]

Q5

a) Explain RR imbalance and the process of resolving it (with code snippets) using AVL rotations. [6]

b) What is a B-tree? What is the need for B trees? [4]

Unit- III

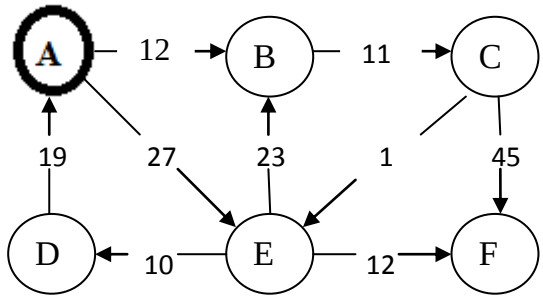
Q6

a) Write the BFS algorithm for graph traversal [5]

b) Demonstrate Quick Sort for following data set:
12, 3, 23, 45, 21, 22, 2, 50, 9, 32 [5]

Q7

a) Demonstrate the running of Dijkstra's algorithm to find the shortest path between node A and all other nodes of the following graph. [5]



b) Explain different collision resolution techniques in Hashing. [5]

Unit- IV

Q8

a) Compare K-Way merge sort using K+1 and 2*K tapes. [5]

b) Explain batch processing using Master and Transaction files. [5]

Q9

a) Demonstrate how polyphase merge sort overcomes the problem of K-Way merge sort using K+1 tapes?

b) Write a short note on buffering.

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