END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY-2011

Paper Code: MCA102 **Subject: Data &File Structure**

Q1 (a) What do we mean by time and space complexity of an algorithm?

(b) Compare the stack and queue data structure.

(c) Compare B^+ and B* trees.

(d) Let G be a simple connected graph with n vertices and m edges. Explain any O(log m) is O(log n).

(e) What is the best case analysis of Merge sort and shell sort?

(f) Give any two uses of tree data structure.

(g) How do we retrieve date from sequential file?

(h) What is a hash function? Why it is used?

(i)Define a critical path in the graph.

(j) What is topological sorting?

UNIT-I

Q2 (a) Convert the following infix expression to its equivalent prefix and postfix expression (A+B)/((D-E) *F).

(b) Consider the following queue of characters, implemented array of six memory locations.

Front=2, Rear=3, queue=_,A,D,_,_,_ where '_' denote empty memory cell. Describe the queue as The following operations takes place:-

(i)Add 'S' (ii)add 'f' (iii) delete two letters (iv)shift towards left to bring all free space to the right side.

Q3 (a) A binary tree T has 3 nodes. The inorder and preorder traversals of yield the following sequence of nodes:-

Inorder	E	A	C	K	F	H	D	B	G

Preorder	F	A	E	K	C	D	H	G	B

(b) A certain professor among us claims that a preorder traversal of a heap will lest out its keys in a Sorted order. Draw a small example of a heap that proves him wrong.

UNIT-II

Q4 (a) Differentiate between the shortest path problem and the minimal spanning tree problem through an example.

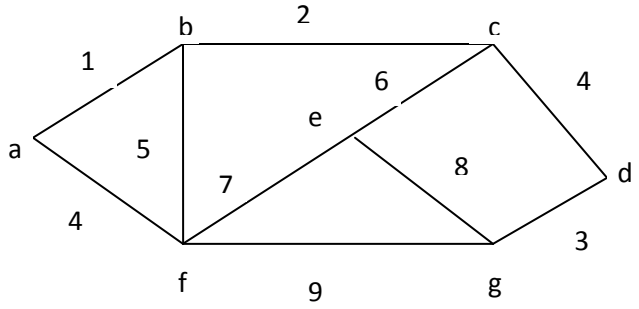
(b) Explain Warshall's algorithm taking an example of your choice.

Q5 Draw a simple, connected weighted graph with 8 vertices and 16 edges each with unique edge Weights identify one vertex as a start vertex and illustrate a running of Dijkastra's algorithm on this Graph.

UNIT-III

Q6 (a) Sort the following list of numbers. Elaborating the steps of selection sort 95,43,51,7,1,46.

(b)Consider the following undirected graph G.



Generate minimum spanning tree for the above graph using Kruskal's algorithm.

Q7 (a) Explain sequential file organization. What are the advantages and disadvantages of this kind of Organization?

(b) What do you understand by topological sort

UNIT-IV

Q8) (a) Differentiate between double buffering and block buffering.

(b) What are various error control techniques? Explain their uses.

Q9 Explain the following:-

(a) Multistacks and multiqueues
(b) Big O notation
(c) Activity Network
(d) Coloring of graph
(e) Merging files k way