

# END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY-JUNE 2012

Paper Code: MCA 102

Subject: Data & File Structure

Time : 3 Hours

Maximum Marks :60

Note: Part-I is compulsory. Attempt one question from rest of the parts.

## PART-I

Q1 Attempt any ten questions of the following :- (2\*10=20)

- a) What is the difference between null array and empty array?
- b) Why always array start with index 0?
- c) What is a null Macro?
- d) Differentiate between static and dynamic list?
- e) What is the difference between null and void pointers?
- f) What do you mean by complete graph?
- g) What is a CONST pointer?
- h) What is sorting? How is sorting essential with data base applications?
- i) What is the difference between FIFO and LIFO?
- j) Explain the working of Tree Sort?
- k) Differentiate between Tree and Graph?
- l) What is the static list? How is it implemented?

## PART-II

Q2 (a) Write a program to implement stack operation push and pop with pointer. (5)  
(b) Convert infix expression to its equivalent postfix expression

$(x+y-z) / (h+k) - z$  ?

(5)

Q3 (a) Write a program to implement queue containing eight elements and perform the insertion and deletion operation. (5)

(b) Convert the following prefix expression into postfix expression  $/*+ABCDE$ . (5)

## PART-III

Q4 (a) Write a function that returns the height of an AVL tree. (5)  
(b) Show the result of inserting 3, 1, 4, 6, 9, 2, 5, 7 into an initially empty binary search tree.

(5)

Q5 (a) Write an algorithm that takes only a pointer to the root of a binary tree T and computes the number of nodes in T. (5)

(b) Show that the maximum number of nodes in a binary tree of height H is  $2^{H+1}-1$ . (5)

**PART-IV**

Q6 (a) Sort the sequence 4, 8, 11, 6, 2, 1, 15, 26, 3 using insertion sort. What is the running of insertion sort if all keys are equal? (5)

(b) Show how Heap sort processes the input- 85, 500, 300, 250, 186, 225, 175. (5)

Q7 (a) Write an algorithm to find Maximum Cost Spanning tree. Is this harder than finding the Minimum Cost Spanning tree? (5)

**PART-V**

Q8 (a) Explain the following types of file organization techniques:- (6)

- (i) Sequential file organization
- (ii) Indexed sequential file organization
- (iii) Direct file organization

(b) Difference between K way polyphase merges. (4)

Q9 (a) Differentiate between sequential file access, random file access and Direct file access and write advantages and disadvantages of one another. Write the situation when which kind of file would be best be used. (6)

(b) What is console I/O and define its types? (4)

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