M.C.A. DEGREE EXAMINATION, MAY - 2015

First Year

Paper - IV : DATA STRUCTURES

Time : 03 Hours   Maximum Marks : 75

SECTION-A   *(3 x 15 = 45)*

Answer Any Three of the following

1) Explain three types of control structures with suitable examples.

2) Write bubble sort algorithm. Use it to find the number C of comparisons and the number D of interchanges which alphabetize the n = 6 letters in PEOPLE.

3) Write an algorithm to transform into infix expression into postfix expression. Apply this algorithm on the expression:

$$((A + B)/D) \uparrow ((E - F) * G)$$

4) Insert 50, 33, 44, 22, 77, 35, 60, 40 into an empty binary search tree and perform the operations i) add 20 ii) add 88 iii) delete 22 iv) delete 77.

5) Write Radix sort procedure and use it to sort the elements: 348, 143, 423, 538, 128, 321, 543, 366.

SECTION-B   *(5 x 5 = 25)*

Answer Any Five of the following

6) Explain the concept of complexity of an algorithm with an example.

7) Discuss about string-oriented operations.

8) Find the table and corresponding graph for the second pattern matching algorithm where the pattern is: ababab.

9) Explain insertion and deletion operations on two-way lists.

10) Discuss about different types of Queues.

11) Define Ackermann function and find A(1,3).

12) Build heap tree for the numbers: 44, 30, 50, 22, 60, 55, 77, 55.

13) Explain selection sort algorithm and apply it on:
77, 33, 44, 11, 88, 22, 66, 55.

SECTION-C $(5 \times 1 = 5)$

Answer All of the following

14) What are data structure operations?

15) What is a record?

16) What is pointer array?

17) What is stack?

18) What is complete binary tree?

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