1801N1608   Candidate's Seat No :_____

MCA Sem-1 Examination
Data Structures
January-2024

Time : 3-00 Hours]   [Max. Marks : 50

Instructions:

* Write both the Sections in the separate answer book.
* Both Sections having equal weightage.
* Draw Diagrams wherever necessary.
* Make Assumptions wherever necessary.

SECTION – I

Q-1 Do as Directed: 05
   a. The data structure required to check whether an expression contains a balanced parenthesis is _____.
   b. Address stored in the pointer variable is of type _____.
   c. In order to fetch the address of the variable we write preceding _____ sign before variable name.
   d. Which of the following operator is used to release dynamically allocated memory space?
   e. A pointer variable can be Returned by a function. **(T/F)**

Q-2 a. Explain popular notations in complexity analysis of algorithms in detail.   05

Q-2 b. Write the difference between recursive and non-recursive Analysis of algorithms?   05

OR

Q-2 a. Explain dynamic allocation of memory for structure with example.   05

Q-2 b. Define Link List. List types of link list. Write a short note on Circular link list.   05

Q-3 Define and explain the stack data structure with suitable example. Give   10
algorithm for push, pop using link list.

OR

Q-3 Consider the following infix expression which is to be converted to   10
postfix expression using stack.
((P + Q) * (R + S)) /T) + (A * (B + C))

${P.T.}$

SECTION – II

Q-4   Explain any two of following Terms with an appropriate example.   05
      a. Priority queue
      b. Heap tree
      c. Shortest path

Q-5   What is meaning of collision in hashing? Explain collision resolution   10
techniques in context of hashing?

OR

Q-5   Explain Dijkstra algorithm with suitable example.   10

Q-6   Define an AVL tree. Write an algorithm to Rotate AVL Tree left and   10
illustrate with the help of example.

OR

Q-6   Define a B-Tree. Build a B-Tree of order 3 created by inserting the   10
following data arriving in sequence 78,11,47,70,32,88,98,90,36,44,84.

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