Total No. of Questions : 8]   *[Total No. of Printed Pages : 2*

Roll No ....

MCADD-202

M.C.A. (Integrated), II Semester

Examination, June 2020

Data Structure Using C

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions .

     ii) All questions carry equal marks.

1. a) Write and discuss various applications of stack and queue data structure in computer.

   b) How to evaluate postfix expression? Write its algorithm and explain with suitable example.

2. a) Write an algorithm for converting an infix expression to postfix. Trace the algorithm indicating the contents of stack for the expression $((A - (B + C))*(D\$(E + F)$

   b) A circular queue of size 5 contains three elements-20,40,60 with front =1 and rear=3. Show with necessary diagrams, what is the value of front and rear after each of these operations.

      i) Insert 50,

      ii) Insert 90

      iii) Insert 30

      iv) Delete

      v) Delete

      vi) Insert 70

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3. Write an algorithm to evaluate a postfix expression and apply for the following expression to find the result with assumption that A = 1, B = 2, C = 3. The expression is AB + C – BA + C.

4. a) Explain linked list using arrays.

   b) Explain various operations on queue.

5. a) Write Dijkstra's algorithm to find the shortest path and explain.

   b) Explain threaded Binary trees?

6. a) What are indexed File? How is a B+ tree used to implement indexes? Explain with example.

   b) What is meant by Hashing and Rehashing? Explain.

7. a) Apply the bubble sort on the following numbers in order to arrange in ascending order.

      25, 5, 100, 10, 75, 15, 35

   b) Discuss merge sort and its efficiency.

                          OR

   What is an AVL Tree? Explain with example and write its properties.

8. Write a C program for sorting the list of integers using Quick sort algorithm obtain the worst case and average case time complexity of this algorithm for the following key sequence 62, 22, 36, 6, 79, 26, 75, 13, 31, 76.

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