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Roll No .....

MCADD-202

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

Examination, May 2019

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 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

2. a) What are linked lists? How do they compare with arrays? Give their relative merits of both when certain operations are carried out.

b) Write C functions to
   i) Insert an item in an ordered linked list
   ii) To delete a specified item

3. a) Why is tree called a nonlinear data structure. Define the following?
   i) Binary tree
   ii) Complete binary tree
   iii) Height of a binary tree

   b) Construct the binary tree given the following traversals.
   Inorder: E A C K F H D B G
   Preorder: F A E K C D H G B

4. a) Write the algorithm for insertion sort and merge sort with examples and discuss their complexities.

   b) What is meant by hashing and rehasing? How do you resolve hash clashes by open addressing method?

5. a) Explain BFS and DFS traversal in Graph.

   b) Write Dijkstra algorithm to find the shortest path and explain.

6. a) Write algorithm to perform insert, delete operation on B tree and explain them with example.

   b) If G is given graph justify F is a spanning forest of G.

7. Describe the linked Implementation of stacks and Queues.

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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