2 0 MAY 2019   Q.P.Code:21841

SG/IT/Sem3/CBCS

(3 Hours)   [Marks: 80]

N.B.: 1) Question No. 1 is compulsory.
2) Answer any three out of remaining questions.
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks.

1. (a) Translate the given infix expression in to equivalent postfix   3
         expression.
                              $(a+ b*c-d)/(e*f)$
    (b) Explain linear and non linear data structures.   3
    (c) What is depth, height and degree of Binary tree.   3
    (d) What are the different ways to represent a graph?   2
    (e) What is linked list? Explain types of linked list.   3
    (f) What is recursion? State its advantages and disadvantages.   3
    (g) Explain asymptotic notations.   3

2. (a) Write an algorithm for implementing queue using array.   10
    (b) Write an algorithm for merge sort and comment on its complexity.   10

3. (a) Explain BFS and DFS algorithm with examples.   10
    (b) Traverse the following binary tree into preorder, inorder, postorder by   10
         giving its algorithm.

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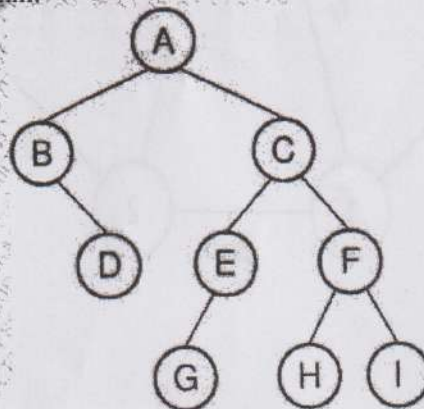
4. (a) What is Doubly Linked List? Write an algorithm to implement   10
         following operations on Doubly linked List.
         (1)Insertion(All cases)
         (2)Traversal(Forward and Backward)

    (b) What is collision? What are the methods to resolve collision? Explain   10
         Linear probing with an example.

5. (a) What is Binary search tree. Construct Binary search tree for following   10
         elements:
                  13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18

    (b) Explain Heap sort using an example. Write algorithm for it and   10
         comment on its complexity.

6. (a) Write an algorithm for implementing stack using array.   10

    (b) What is Minimum Spanning Tree? Draw the MST using kruskal's and   10
         prim's algorithm and find out the cost with all intermediate steps.

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