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322453(22)

B. E. (Fourth Semester) Examination, April-May 2021

(New Scheme)

(CSE Engg. Branch)

DATA STRUCTURES

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each unit is compulsory and carries 2 marks. Attempt any **two** parts from (b), (c) and (d) each question and carries 7 marks.*

Unit-I

1. (a) What do you mean by data structure and need to study it.

(b) What are asymptotic notations? Explain about $0(h)$ notation, $\Omega(h)$ notation and $\theta(h)$ notation.

(c) (i) Write an algorithm to insert a node at n^{th} position in a single linked list.

(ii) Write an algorithm to delete a node from the beginning in a doubly linked list.

(d) Write algorithm for insertion and deletion in one diamensional array and state it any disadvantage associated with it.

Unit-II

2. (a) Evaluate the following :

(i) 5 6 2 + * 12 4 / –

(ii) – * 5 + 6 2 / 12 4

(b) Write an algorithm to convert in fix expression to postfix, support your answer with example.

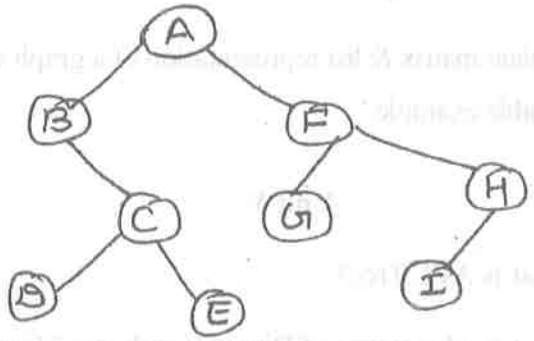
(c) What is Recursion? Explain Tower of Hanoi algorithm with example.

(d) What is queue data structure? Write algorithm to

insert element in a queue. Support your answer with example.

Unit-III

3. (a) Convert the following tree in postorder and inorder traversal.



(b) Explain threaded binary tree with suitable example.

(c) Construct binary tree from given post order and inorder traversal.

Post order : D F E B G L J K H C A

Inorder : D B F E A G C L J H K

(d) Write an explain Huff man algorithm and explain its use.

Unit-IV

4. (a) Define directed graph with example.

   (b) Explain BFS (Breadth First Search) algorithm with example.

   (c) Explain prim's algorithm for finding minimal spanning tree with example.

   (d) Explain matrix & list representation of a graph with suitable example.

Unit-V

5. (a) What is AVL Tree?

   (b) What is advantages of Binary search tree? Explain with suitable example.

   (c) Explain insertion sort algorithm supporting with example.

   (d) Explain quicksort algorithm with its complexity.