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B. E. (Fourth Semester) Examination, April-May 2020

(New Scheme)

(IT Branch)

DATA STRUCTURES and ALGORITHM ANALYSIS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

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

Unit-I

1. (a) What is the properties of algorithm?

(b) Explain row-major and column major order of two dimensional array with effective address evaluation.

(c) Explain sparse matrix and its memory allocation techniques to reduce space complexity with example.

(d) Explain different type of algorithm with example.

Unit-II

2. (a) What is priority queue?

(b) Write an algorithm to convert infix expression to postfix expression using stock convert the following infix expression to postfix expression :

$$(A-B)/(C\times D \wedge E)$$

(c) Write algorithm to insert and delet elements from circular queue.

(d) Write algorithm to insert element is linked list :

(i) At the begining

(ii) At the end

(iii) At between locations

Unit-III

3. (a) What is divide and conquer strategy for writing algorithm?

(b) What is hashing? Explain different techniques of hashing.

(c) Write on algorithm for binary search technique and find best, average and most case time complexity.

(d) Write algorithms for merge sort and analyze the algorithms is terms of time complexity.

Unit-IV

4. (a) What is complete binary tree?

(b) Create AVL tree with balance factor – 1, 0 or 1 for the following inputs

55, 66, 15, 11, 33, 22, 35, 25, 44, 88, 99

(c) Construct binary tree from its given preorder and post-order traversal.

Preorder : A B D G H K C E F

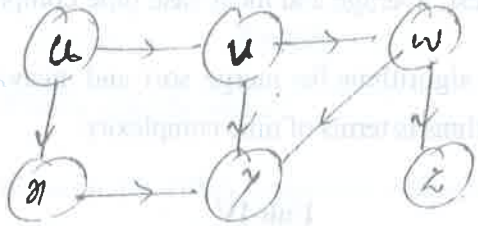
Postorder : G K H D B E F C A

(d) Explain insertion and deletion in a B-tree with example.

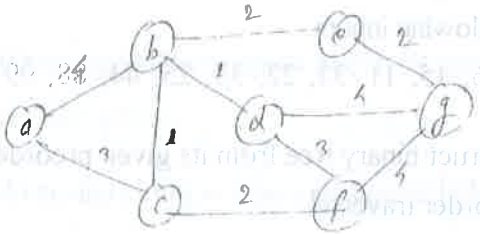
Unit-V

5. (a) What is a graph?

(b) Find traversal order using DFS and BFS for the following graph. Storting node in u.



(c) Create minimum spanning tree using kruskal algorithm for the following graph. Write ach step.



(d) Explain adjacency matrices and adjacency list of graph represent at ion with example.