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18/103-C

B.C.A. (Second Semester) Examination, 2018

Paper : Third

(BCA-203-Data & File Structure Using 'C')

Time : Three Hours] *[Maximum Marks : 70*

Note : Attempt questions from **all** sections as per instructions.

Section - A

Note : Attempt **all** parts of this question. Give answer of each part in about 50 words. 1½×10=15

1. (a) Define Queue.

(b) Explain the performance analysis of the algorithm.

(c) Define sparse matrix.

(d) Define binary search tree.

(e) Define graph.

(f) Define hashing.

(g) Define string array.

(h) Define transitive closure.

(i) Define garbage collection.

(j) Write time complexity of Quick sort.

Section - B

Note : Attempt **all** questions. Give answer of each question in about 200 words. 7×5=35

2. Explain the type of data structures with example.

OR

Explain various operations on data structure.

3. Write a program to insert a new element in the given unsorted array at K^{th} position.

OR

Write an algorithm to implement a stack using array.

4. State the steps and convert the following expression to postfix R/D-Y*(G/C*(D-E)+B/Z)+S*A.

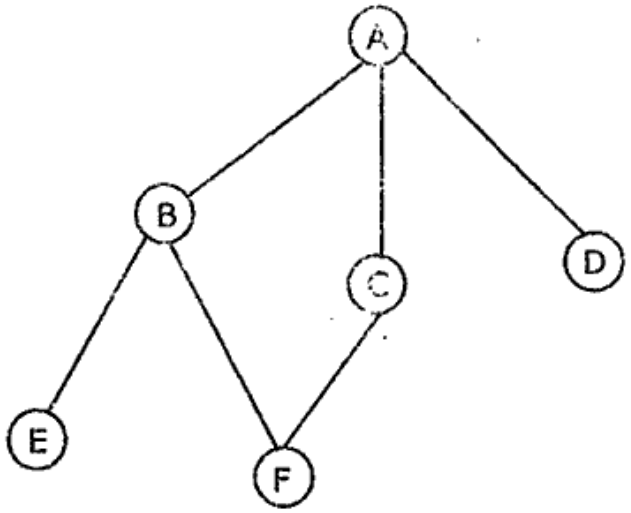
OR

What are various operations of queue? Explain with algorithm.

5. What is spanning Tree? Write Kruskal's algorithm to identify minimum spanning tree.

OR

Apply BFS and DFS on the below graph.



6. Write a C program for Quick sort.

OR

What are indexed files? How is B+ tree used to implement indexes?

Section - C

Note : Attempt any two question. Give answer of each question in about 500 words.

10×2=20

7. Write an algorithm for insertion in a sorted linked list.

8. What are height balanced trees? Insert the following nodes one-by-one and balance the tree at each step : A,B,C,D,F,G,E,H,I,K,L,Q,I,F

9. Consider a tree having pre-order and in-order. Draw the tree

   In-order : Z, A, Q, P, Y, X, C, B

   Pre-order: Q, A, Z, Y, P, C, X, B

10. Write an algorithm to merge two circular lists, A and B, to produce a list C.

11. Explain the working of merge sort 10, 15, 0, 17, 20, 25, 30, 16, 70, 6 Show all intermediate steps. Also give its time complexity.