Code: 15A05201

R15

DATA STRUCTURES

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

 (a) What is best case and worst case performance?

 (b) Write the procedure for deleting an element from the list.

 (c) Convert ((A + B) * C - (D - E)) \$ (F + G) to postfix and prefix notation.

 (d) What are the limitations of linear queue? How they can be rectified?

 (e) What is an articulation point in a graph?

 (f) What is the difference between full binary tree and complete binary tree?

 (g) What are the various transformations performed in AVL tree?

 (h) What is the recurrence relation for worst case of Binary Search?

 (i) What are self-referential structures?

 (j) List the different types of collision resolving techniques.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Describe the role of space and time complexities in measuring the performance of a program with an example.

OR

3 Design and implement an algorithm to search a linear ordered linked list for a given alphabetic key or name.

UNIT – II

4 Implement a queue so that each element of a queue holds a list of integers. Write the functions add Q and remove Q from such queue.

OR

5 What is a stack? Write its applications. Write down the procedure for implementing various stack operations.

UNIT – III

6 (a) Discuss about all cases in deleting an element from a BST. Give suitable example for each case.

 (b) Construct Binary Search Tree by inserting the following key elements:

   11, 15, 5, 6, 8, 4,17 & 15.

OR

7 Write and explain Dijkstra's algorithm for finding shortest path with an example.

UNIT – IV

8 Write an algorithm to sort a set of 'N' numbers using selection sort. Trace the algorithm for the following set of numbers: 14, 22, 80, 16, 67, 26, 43, 54 and 10.

OR

9 Explain merge sort with an example and analyze its complexity.

UNIT – V

10 Compare bucket hashing with open hashing and closed hashing. Write algorithm to search key value, insert key value and delete a key value in bucket hashing.

OR

11 Write a C program that search for a value in a stored array using non recursive binary search.

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