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020305

December 2023

B.Tech. (RAI) IIIrd SEMESTER

Data Structure (PCC-RAI-303-21)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What is Big oh Notation? (1.5)

(b) What is time space tradeoff in algorithms? (1.5)

(c) The inorder and preorder traversal of a binary tree are d b e a f c g and a b d e c f g, respectively find the postorder traversal. (1.5)

(d) What is the time complexity of merge sort? (1.5)

(e) What are the advantages of circular linked list? (1.5)

(f) What are the advantages of B+ Tree? (1.5)

(g) What is priority queue? (1.5)

(h) What are various graph representation techniques? (1.5)

(i) What is threaded binary tree? (1.5)

(j) What dp you mean by divide and conquer in algorithms? (1.5)

PART–B

2. (a) What are the advantages of Binary Search technique? Write iterations of search of 23 in array {2, 5, 8, 12, 16, 23, 38, 56, 72, 91}. (10)

(b) Explain the following : (5)

(i) Push operation in stack.

(ii) Delete operation in Queue.

3. (a) Explain merge sort in detail. (5)

(b) Write various steps and stack values to convert ((A + B) – C * (D / E)) + F expression to postfix. (10)

4. (a) What is link list? Write an algorithm for insertion in link list at beginning and end. (10)

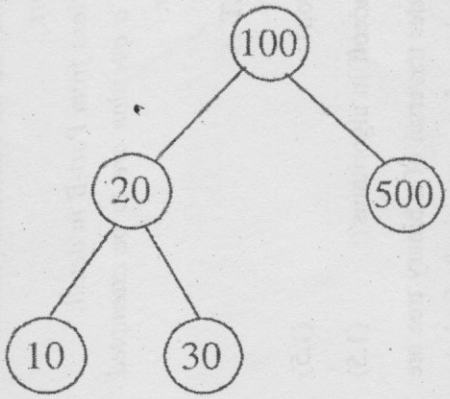
(b) Write an algorithm for insertion in doubly link list after a specified element. (5)

5. (a) Explain Heap sort algorithm. (5)

(b) Explain the concept of circular queue. Write C code for circular queue implementation. (10)

6. (a) Construct AVL tree for the following data 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7. (10)

(b) Consider the below BST and what will be the new BST after insertion of 40. (5)



7. (a) What are the applications of graph data structure? Explain DFS algorithm of traversal in detail. (10)

(b) What are the various collision avoidance techniques in Hashing? (5)
