Sr. No. 003303

January 2023

B.Tech- III SEMESTER

Data Structures & Algorithms (PCC-CS-301)

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

Q1 (a) What is time space tradeoff in algorithms? (1.5)

(b) What are the advantages of circular linked list? (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 are the advantages of B+ Tree? (1.5)

(e) What is bubble sort? (1.5)

(f) What is BFS? (1.5)

(g) What is priority queue? (1.5)

(h) What are various data structure operations? (1.5)

(i) What are various tree rotation techniques in AVL? (1.5)

(j) What are the advantages of threaded binary tree? (1.5)

PART -B

Q2 (a) Explain Linear Search and binary search technique and compare complexity of both the techniques. (10)

(b) What are asymptotic notations? Explain different types also. (5)

Q3 (a) What is circular queue? What are its applications? Explain the underflow and overflow conditions in circular queue. (5)

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

Q4 (a) What are linked list. Write algorithm for insertion in link list after a specified element. (10)

(b) Construct AVL tree for the following data 21,26,30,9,4,14,28,18,15,10,2,3,7 (5)

Q5 (a) What are collision avoidance techniques in hashing? (5)

(b) Explain the following: (10)

(i) Push operation in stack

(ii) Delete operation in Queue

Q6 (a) Write function for binary search tree inorder traversal. (5)

(b) Write code/algorithm for doubly linked list reverse traversal. (10)

Q7 (a) Write algorithm/code for following techniques (15)

(i)Quicksort

(ii) MergeSort

(iii) Depth First Search

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