Sr. No.-504106

January 2023

M.Tech.- I SEMESTER

Advanced Data Structures (MCS-18-102)

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) Define ADTs in brief with suitable examples and applications. (1.5)

(b) Differentiate Log-files and Look-up tables. (1.5)

(c) Compute time complexity for Ternary Search. (1.5)

(d) Explain recurrence relations with appropriate examples. (1.5)

(e) Define Linear Probing. (1.5)

(f) What are Splay Trees and its application? (1.5)

(g) State the condition which shows the need to use the circular queue. (1.5)

(h) Differentiate 2 3 Trees and 2 4 Trees with appropriate examples (1.5)

(i) Write non-deterministic algorithm to search an item in a list. (1.5)

(j) Define Topological sort in brief. (1.5)

PART -B

Q2 (a) Explain the complexity of implementation of log-files (Insert, Search and delete). (10)

(b) Explain any three collision resolution techniques. (5)

Q3 (a) What is Skip-list? Explain its implementation and complexity in brief. (5)

(b) Explain AVL tree methodology to balance tree and whether Red-trees can replace the balancing applications of AVL trees. (10)

Q4 What are randomized algorithms? Explain randomized quicksort, its complexity and its advantages. (15)

Q5 Differentiate the Top-down and Bottom-up approach for longest common subsequence and also find the LCS between "STRANGER" and "RANGE". (15)

Q6 (a) Explain 1-D, 2-D and k-D search with appropriate examples. (10)

(b) Explain priority searching in brief. (5)

Q7 What are the recent trends in the Hashing and Trees? Explain in detail. (15)

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