

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - II COMPUTER SCIENCE & BUSINESS SYSTEMS : SUMMER : 2024
SUBJECT: DATA STRUCTURES & ALGORITHMS

Day : Tuesday
Date : 28/05/2024

S-24138-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat labelled diagrams **WHEREVER** necessary.

Q.1 Define Asymptotic notations and explain their significance. (10)

OR

Q.1 What is space and time complexity and its trade off? Justify with some examples. (10)

Q.2 What is doubly linked list? Explain its significance and all types of insertions and deletions in DLL. (10)

OR

Q.2 Write algorithm to convert infix expression to prefix expression. Find out the prefix notation of the infix expression. $A / B - C + D * E - A * C$. (10)

Q.3 Create an AVL Tree by inserting 45, 36, 76, 23, 89, 11, 98, 39, 41, 56, 69 and 48. Show change in tree structure clearly after every insertion. (10)

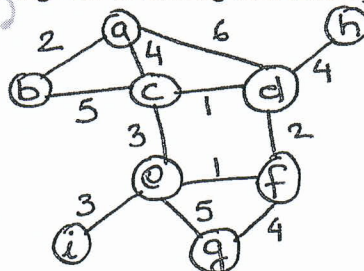
OR

Q.3 Define and explain Binary tree and its properties. Explain with neat diagram what is skewed binary tree, full binary tree, complete binary tree and perfect binary tree. (10)

Q.4 Define graph. What are different representations of graph? Show examples for both directed and undirected graphs. Which representation is better and in which case? Justify your answer. (10)

OR

Q.4 Write DFS algorithm along with its running time. Also apply DFS on the given graph. (10)



Q.5 What is heap data structure? Also explain the procedure of heapify using example. Sort the array using heap sort. 73, 6, 5, 88, 60, 42, 83, 72, 48, 85. Show all intermediate steps clearly. (10)

OR

Q.5 Explain what is divide and conquer strategy? Explain any one sorting algorithm that uses divide and conquer strategy. Sort the given numbers and show all intermediate steps. 70, 50, 30, 10, 20, 60, 40, 90, 80. (10)

Q.6 Explain in detail what is indexed sequential file organization? Assume suitable data for your file. (10)

OR

Q.6 Explain in detail what is direct file organization? Assume suitable data for your file. (10)