BACHELOR OF TECHNOLOGY (CBCS - 2023)

B. Tech. Sem-II COMPUTER SCIENCE & BUSINESS SYSTEMS : SUMMER : 2024

SUBJECT: DATA STRUCTURES & AL`GORITHMS

Day : Tuesday
Date : 28/05/2024

S-27709-2024

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) Assume suitable data **IF** necessary.
4) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 Discuss Masters theorem. **(10)**

OR

Q.1 Calculate the time complexity using Master's theorem recurrence relation for following functions: **(10)**

a) $4T\left(\frac{n}{2}\right) + n$

b) $3T\left(\frac{n}{2}\right) + n$

Q.2 Define the linked list and its types discuss the basic operations can be performed on linked list. **(10)**

OR

Q.2 Differentiate between stack and queue. **(10)**

Q.3 Discuss the various cases of deletion of element from the B+ Tree with example. **(10)**

OR

Q.3 Create a B+ tree of the Order 4 for the given elements. **(10)**
1,4,7,10,17,21,31,25,19,20,28,42

Q.4 Define shortest path and Discuss dijkstra's algorithm with example. **(10)**

OR

Q.4 Discuss the graph traversal algorithms with examples. **(10)**

Q.5 Discuss the following sorting techniques. **(10)**

a) Selection Sort,
b) Shell Sort

OR

Q.5 Discuss divide and conquer in detail with example. **(10)**

Q.6 Discuss with example **(10)**

a) Sequential access,
b) Random access and

OR

Q.6 Discuss with example **(10)**

a) Index access.
b) Hashed

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