

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - IV Computer Science & Engineering AI & ML : WINTER : 2023
SUBJECT : ALGORITHMS ANALYSIS & DESIGN

Day : Wednesday

Time : 02:30 PM-05:30 PM

Date : 22-11-2023

W-23948-2023

Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non programmable **CALCULATOR** is allowed.

Q.1 What are recurrence relations and Masters theorem? Apply Masters Theorem on following: (10)

$$T(n) = 2T(n/2) + n/\log n$$

OR

- Q.1** a) Write a note on Asymptotic Notations. (05)
b) With suitable example explain Recursive Algorithms. (05)

Q.2 Sort the list of the elements 10,5,7,6,1,4,8,3,2,9 using merge sort algorithm and show its computing time is $O(n \log n)$. (10)

OR

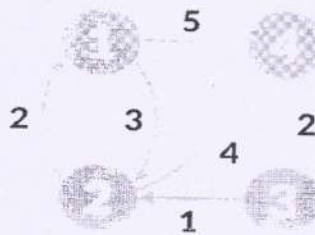
Q.2 Write the binary search algorithm and apply it on following dataset to search the key element: 56 (10)

10, 2, 24, 29, 39, 40, 51, 56, 69.

Q.3 Explain Dijkstra's Single source shortest path algorithm. Explain how it is different from Bellman Ford algorithm. Explain 15-puzzle problem using LC search technique. (10)

OR

Q.3 Write Floyd-Warshall. All pair Source shortest path algorithm and apply it on following: (10)



- Q.4** a) What are multistage graphs? Give examples. (10)
b) What is Travelling Salesperson problem and what are its applications. (10)

OR

Q.4 What is Longest common Subsequence problem? Find LCS for the following: (10)

**LONGEST
STONE.**

P.T.O.

Q.5 What is string matching? Explain Rabin Carp Algorithm with suitable examples. (10)

OR

Q.5 Rewrite KMP algorithm and explain with example. (10)

Q.6 Write a short note on following: (10)

1. Steps for NP Completeness proofs.
2. Differentiate between P and NP.

OR

Q.6 Write a detailed note on Randomized and Parallel algorithms. (10)

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