Computer Science & Engineering AI & ML

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-IV CS&E-A&M : WINTER: 2025
SUBJECT: DESIGN & ANALYSIS OF ALGORITHMS

Day : Monday
Date : 01/12/2025

W-29281-2025

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 **WHEREVER** necessary.
4) Draw neat diagrams **WHEREVER** necessary.

Q. 1 **a)** Define asymptotic notations and the need for asymptotic notation. **(05)**

b) Demonstrate the Worst case, Average case and Best Case behavior of an algorithm with suitable example. **(05)**

OR

Q. 1 Apply Masters Theorem on following: **(10)**

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

b) $T(n) = 3T(n/3) + n/2$

Q. 2 Explain Strassen's Matrix Multiplication algorithm and find its complexity. **(10)**

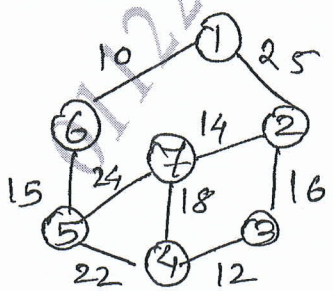
OR

Q. 2 Sort the following list of elements in ascending order using Quick sort technique. Give the output of each pass. 25, 36, 18, 56, 31, 87, 65, 22. Also Comment on worst case, best case and average case complexity of quick sort. **(10)**

Q. 3 Write Ford Fulkerson algorithm and show its working by applying it on a suitable graph. **(10)**

OR

Q. 3 Compare Prims and Kruskals method for finding Minimum spanning Tree find MST for following using Prim's algorithm. **(10)**



Q. 4 **a)** Explain Multistage graphs. **(05)**

b) What is Travelling Salesperson problem and what are its applications? **(05)**

OR

Q. 4 Write a note on: **(10)**

a) Assembly- line scheduling problem.

b) Network Flow Algorithm.

Q. 5 Write Naive String Matching algorithm and Apply Naive String matching algorithm on following data: **(10)**

Give string: HEY-HELLO
String to be matched: HELLO

P.T.O.

OR

Q. 5 Write and explain Rabin Karp String Matching algorithm and give suitable example. (10)

Q. 6 Apply sum of subsets procedure to find the sum = 30, on following data (5, 10, 12, 13, 15, 18) (10)

OR

Q. 6 Describe FIFO Branch and Bound and LC Branch and Bound in detail. (10)

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