

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - IV Computer Science & Engineering : WINTER: 2025
SUBJECT: DESIGN OF ALGORITHMS

Day : Monday
 Date : 01/12/2025

W-25584-2025

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 if necessary.
- 4) Use of non-programmable calculator is allowed.

Q.1 Describe in detail time and space trade off. (10)

OR

Q.1 What are the different asymptotic notations? Explain with definition and neat diagram. (10)

Q.2 What are greedy algorithms? Explain any greedy algorithm in detail. (10)

OR

Q.2 State advantages and disadvantages of Brute Force method. (10)

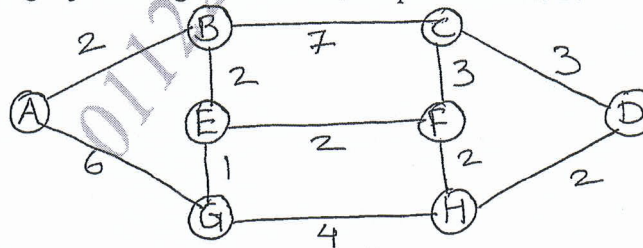
Q.3 Explain the terms: i) Branch and bound, ii) LC iii) LIFO techniques with examples. (10)

OR

Q.3 For a directed graph the edge length matrix is given below. Solve travelling salesman problem for four city graph using Dynamic Programming. Also state time complexity. (10)

$$\begin{bmatrix} 0 & 9 & 8 & 8 \\ 12 & 0 & 13 & 6 \\ 10 & 9 & 0 & 5 \\ 20 & 15 & 10 & 0 \end{bmatrix}$$

Q.4 Using Dijkstra's algorithm find shortest path from A to D. (10)



OR

Q.4 Explain transitive closure with example. (10)

Q.5 What is back tracking, demonstrate using graph colouring problem. (10)

OR

Q.5 What is back tracking, demonstrate on sum of subset problem. (10)

Q.6 What is polynomial time verification and reduction? Explain with neat diagram. (10)

OR

Q.6 Order the following functions by growth rate : N , $N^{1.5}$, N^2 , N , $\log N$, $N \log^2 N$, $N \log(N^2)$, $2/N$, 2^N , $2^{N/2}$, $N^2 \log N$. Identify which functions grow at some rate. (10)

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