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DCCA402

Reg. No.

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IV Semester B.C.A. Degree Examination, July/August - 2024

COMPUTER SCIENCE

Design and Analysis of Algorithms

(NEP Scheme)

Time : 2½ Hours

Maximum Marks : 60

**Instructions to Candidates:**

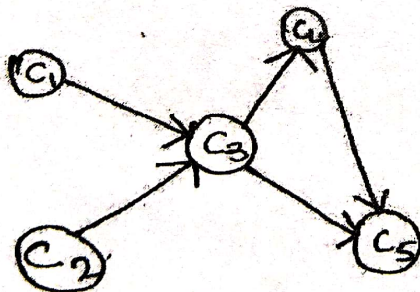
Answer all the sections.

**SECTION - A****I. Answer any Four questions. Each question carries 2 marks.****(4×2=8)**

1. List any two important characteristics of algorithm.
2. Define divide and conquer techniques.
3. What is minimum cost spanning tree? Give an example.
4. Define binary tree. List three types of binary tree traversal.
5. Define Huffman codes.
6. What is backtracking?

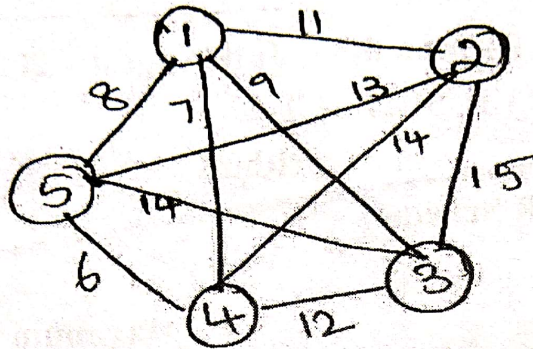
**SECTION - B****II. Answer any Four questions. Each question carries 5 marks.****(4×5=20)**

7. Explain worst case, best case and average case efficiencies with examples.
8. What is recursive algorithm? Analyse time efficiency for finding factorial of a number.
9. Write a program to solve Tower of Hanoi problem for different number of disks.
10. What is topological sorting? Find the topological sort of a given graph using source removal method.

**[P.T.O.]**



11. Find the minimum weight spanning tree using prime algorithm.



12. Construct solution space tree for a set  $S = \{11, 13, 24, 7\}$  &  $M = 31$ .

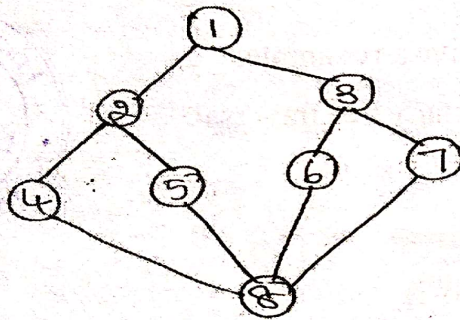
**SECTION - C**

III. Answer any **Four** questions. Each question carries **8** marks.

**(4×8=32)**

13. Explain in detail the Strassen's Matrix Multiplication method. Compare its efficiency with the conventional matrix multiplication method.

14. Write the DFS traversal for the given graph.



15. Trace the quick sort algorithm for the following numbers.

45,36,15,92,35,71,64,39,73,37.

16. Solve 4-queue problem by back tracking technique. Draw solution state - space tree.

17. Find the optimal solution for a knapsack problem with  $M = 40$ .

$N = 4, \{W_1, W_2, W_3, W_4\} = \{20, 25, 10, 15\}$

$\{P_1, P_2, P_3, P_4\} = \{20, 40, 35, 45\}$ .

18. Write a short note on :

a. Hamilton circuit problem.

b. Decision tree.