

**B.M.S. COLLEGE FOR WOMEN, AUTONOMOUS**  
**BENGALURU – 560004**  
**SEMESTER END EXAMINATION–SEPTEMBER 2023**

**B.Voc-IT – 4<sup>th</sup> Semester**

**DESIGN AND ANALYSIS OF ALGORITHM**  
**(NEP Scheme 2021-22 Onwards)**

**Course Code: BVIT4DSC11**

**Duration: 2 ½ Hours**

**QP Code: 4035**

**Max. Marks: 60**

*Instruction: Answer all the sections.*

**SECTION-A**

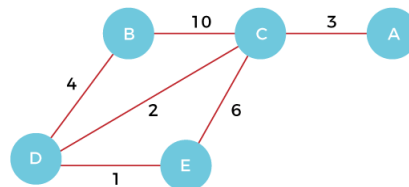
**I. Answer any TEN questions. Each question carries TWO marks. (10X2=20)**

1. Define Algorithm.
2. Mention the different types of asymptotic notations?
3. What is an efficiency class?
4. What is Brute-Force String Matching?
5. Define Topological Sorting.
6. What is Strassen's Matrix?
7. Define Hashing.
8. State the Principle of Optimality.
9. Define Binomial Coefficient.
10. Mention any two Limitations of Algorithm Power.
11. Define Lower-Bound Arguments.
12. State Back Tracking.

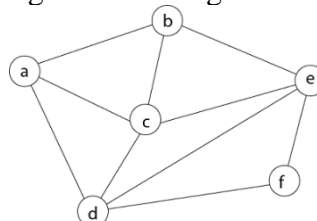
**SECTION-B**

**II. Answer any FIVE questions. Each question carries FOUR marks. (5X4=20)**

13. Mathematically analyse Non-recursive and Recursive algorithms.
14. Briefly explain any two Fundamental Data Structures with example.
15. Compare Selection Sort and Bubble Sort.
16. Illustrate Input Enhancement in String Matching using Horspool's algorithm.
17. Demonstrate the working of prim's algorithm using the given graph.



18. Generate a Hamiltonian circuit using Backtracking method for the given graph  $G = (V, E)$



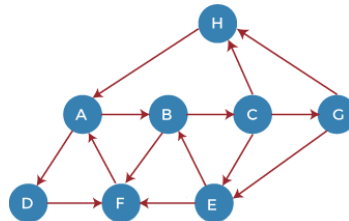
19. Compare NP class and CO-NP class.

### SECTION-C

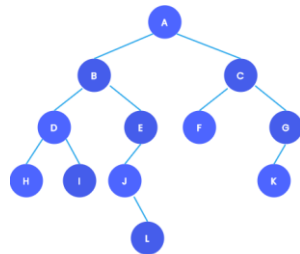
III. Answer any TWO question. Each question carries TEN marks.

(10X2=20)

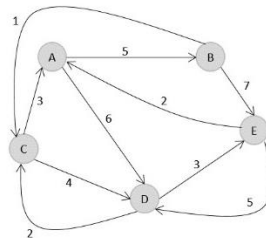
20. Apply Depth First Search algorithm for the following graph and explain.



21. Explain the different ways for traversing a binary tree. Apply any two Binary tree traversal algorithms for the given binary tree.



22. Write the Significance of Floyd-Warshall algorithm and find the shortest paths between all the vertices of the given graph  $G = \{V, E\}$  using the Floyd-Warshall algorithm.



23. Write Knapsack algorithm and solve the given problem: For the given set of items and the knapsack capacity of 10 kg, find the subset of the items to be added in the knapsack such that the profit is maximum.

Items	1	2	3	4	5
Weights (in kg)	3	3	2	5	1
Profits	10	15	10	12	8

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