



B.C.A. V Semester Degree Examination, Sept./Oct. - 2024

COMPUTER SCIENCE

DSC 13 : Design and Analysis of Algorithm

(NEP)

Time : 2 Hours

Maximum Marks : 60

SECTION - A

I. Answer **all** the following sub-questions. Each sub-question carries **one** mark.

10x1=10

1. (a) Define an algorithm.
- (b) What is recursive algorithm ?
- (c) Write any two characteristics of an algorithm.
- (d) What is time complexity ?
- (e) What is Knapsack problem ?
- (f) Define dynamic programming.
- (g) Define Binary Search.
- (h) What is Topological Sorting ?
- (i) Define Binary Tree traversal.
- (j) Name any two Greedy Techniques.

SECTION - B

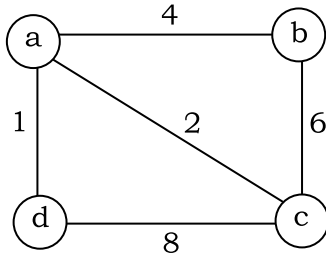
II. Answer **any four** of the following questions. Each question carries **five** marks.

4x5=20

2. Write a note on Asymptotic Notations.
3. Give general plan of mathematical analysis of recursive algorithm with example.
4. Write Quick Sort algorithm with an example.



5. Apply brute force exhaustive search approach to solve Travelling Salesman Problem (TSP).



6. Explain the characteristics of an algorithm.
7. Explain decision tree with an example.

SECTION - C

- III. Answer **any three** of the following questions. Each question carries **ten** marks.

3x10=30

8. Write a note on Fundamentals of algorithm problem solving.
9. Write and explain BF's algorithm with an example.
10. Apply Greedy technique to solve the following instance of Knapsack problem.
 $n = 4, M = 10, W_1, W_2, W_3, W_4$
 $= \{7, 3, 4, 5\}$
 $V_1, V_2, V_3, V_4 = \{42, 12, 40, 25\}$
11. Write and explain Binary Search algorithm with an example.
12. Explain Kruskal's algorithm.

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