MCA 24106
MCA DEGREE EXAMINATIONS
FIRST SEMESTER
DESIGN & ANALYSIS OF ALGRITHMS
(w.e.f. Admitted Batch 2024 - 25)

Time: 3 Hours **Max. Marks: 75M**

SECTION - A

All Questions Carry Equal Marks

Note :- All parts of the questions must be answered at one place only **(4 X 15 = 60 M)**

1. a. Describe the Fundamentals of Algorithmic Problem Solving.
   b. Explain about asymptotic notations and classify the basic asymptotic efficiency classes.

(OR)

2. a. Explain the Performance of algorithm analysis efficiencies of with help of an example.
   b. Explain the general plan for analyzing the efficiency of recursive algorithm with example.

3. a. Explain the concept of divide and conquer methodology with binary search algorithm.
   b. Discuss the merge sort algorithm with recursive tree and its efficiency. Apply the same algorithm to sort the list {4, 6, 1, 3,9, 5,2, 7}.

(OR)

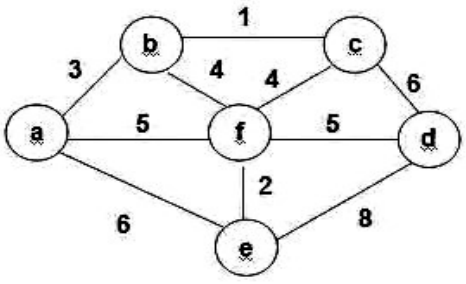
4. a. Discuss the various types of decrease and conquer algorithms.
   b. Describe concept of transform - and - conquer algorithm with example.
5. a. Solve the following instance of the 0/1, knapsack problem given the knapsack capacity is W = 5.

ITEM	WEIGHT	VALUE
1	2	12
2	1	10
3	3	20
4	2	15

b. Explain Floyd's algorithm for all pairs shortest path problem With Example

(OR)

6. a. Write prim's and kruskal's algorithm to solve the minimum spanning tree to graph.



b. Explain Dijkstra's Algorithm with suitable examples.

7. a. Distinguishes the "Branch and Bound "and" Back tracking" techniques.
   b. Explain the back tracking algorithm for the n - queens problem?.

(OR)

8. a. Explain Travelling Salesman Problem with branch and bound.
   b. Explain P, NP and NP complete problems.

SECTION-B

Answer **Any 5** of the Following. **(5 X 3 = 15 M)**

9. How to calculate the efficiency of an algorithm?
10. What is the exhaustive search?
11. What is divide–and-conquer with example?
12. Distinguishes between DFS and BFS.
13. Compare divide and conquer and dynamic programming methods.
14. What are the basic concepts in greedy method?
15. What is Hamiltonian circuit and its example?
16. What are the applications of Backtracking?

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