Register Number: ……

M.C.A DEGREE EXAMINATIONS: JUNE 2012

Second Semester

MASTER OF COMPUTER APPLICATIONS

MCA507: Design and Analysis of Algorithms.

Time: Three Hours **Maximum Marks: 100**

Answer All Questions:-

PART A (10 x 2 = 20 Marks)

1. Define Algorithm.
2. What is Weighted graph?
3. What is time complexity?
4. Which algorithm is known as single source shortest path problem?
5. Write the formulas of Master's Theorem.
6. What is the best case time efficiency of Quick sort?
7. Differentiate the Dynamic programming from Divide and conquer method.
8. What is the input and output of the Warshall's algorithm?
9. Define state space tree.
10. Write an application of branch and bound technique.

PART B (5 x 16 = 80 Marks)

11. a) Explain the fundamentals of algorithmic problem solving in detail.

(OR)

b) Describe various properties of a Graph with suitable examples.

12. a) Explain the Dijkstra's algorithm with suitable example and analyze the efficiency.

(OR)

b) Explain Prim's algorithm in detail with suitable example and analyze the efficiency.

13. a) Describe merge sort algorithm in detail with example and analyze the efficiency.

(OR)

b) Explain the algorithm to calculate the height of the binary tree and analyze the efficiency.

14. a) (i) Write the algorithm to calculate binomial coefficient. (8)

(ii) Calculate binomial coefficient for C (4, 3). (8)

(OR)

b) (i) Explain the algorithm of optimal binary search tree (6)

(ii) Construct the optimal binary search tree for the following problem. (10)

Key	A	B	C	D
Probability	.1	.2	.4	.3

15. a) (i) Describe back tracking technique with algorithm. (8)

(ii) Explain N Queen problem with example. (8)

(OR)

b) Solve the following instance of the knapsack problem by the branch and bound technique with Knapsack capacity W=10

Item	**Weight**	**Value**
1	4	40
2	7	42
3	5	25
4	3	12

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