MCA–652 MCA-12

M.C.A. DEGREE EXAMINATION – JUNE 2008.

Second Year/Third Semester

DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 hours Maximum marks : 60/75

Answer for 5 marks questions should not exceed 2 pages.

Answer for 10/15 marks questions should not exceed 5 pages.

PART A — (4 × 5 = 20)/(5 × 5 =25)

Candidates with enrolment number starting with A4MCA and C5MCA should answer any FOUR from Question 1 to 6 and all others should answer any FIVE from question 1 to 7 in Part A.

1. How will you analyse an algorithm?

2. Write an algorithm for binary search and analyse its complexity.

3. Define recursion. Explain it with an example.

4. State the bubble sort algorithm and explain it.

5. What is divide and conquer technique? Explain it.

6. How will you traverse a tree?

7. State and explain the Dijkstra's algorithm for graphs.

PART B — (4 × 10 = 40)/(5 × 10 = 50)

Candidates with Enrolment Numbers starting with A4BCA and C5BCA should answer any FOUR from Question No 8 to 13 and all others should answer any FIVE from Question No 8 to 14 in Part B.

8. What is meant by induction? Using induction prove that $1^2 + 2^2 + ... + n^2 = \frac{n(n+1)\ (n+2)}{6}$.

9. State and explain the merge/sort algorithm.

10. Explain the quick sort algorithm and its complexity.

11. Explain the graph representation techniques.

12. What is hashing? Explain an hashing technique.

13. State and explain the Kruskal's Minimum Spanning Tree algorithm.

14. Explain the Depth First technique by solving the Travelling Salesman Problem.