B.TECH DEGREE EXAMINATION,MAY 2013

MODEL QUESTION PAPER

Sixth Semester

Branch: Computer Science and Engineering

CS010 601 DESIGN AND ANALYSIS OF ALGORITHM

Time : Three Hours Maximum : 100 Marks

Answer ***all*** *the questions.*

Part A

Each question carries 3 *marks.*

1. What is the need of obtaining the time and space complexity measures of an algorithm?
2. What is the notion behind divide and conquer method.
3. Write a note on multistage graph problem.
4. Explain the control abstraction for back tracking technique.
5. Differentiate between Deterministic and nondeterministic algorithm.

(5 x 3 = 15 marks)

Part B

Each question carries 5 *marks.*

6. With the help of example explain how a recursive algorithm can be represented by recurrence relation.
7. Show the various steps involved in the quick sorting of (1,3,4,-5,9,2,6,5,3).
8. What is relevance of greedy method to solve knapsack problem.
9. Does an N Queens problem with 3X 3 board have a solution? How many solutions are there for the 8 queens problem?
10. Explain complexity of K^{th} element selection?

(5 x 5 = 25 marks)

Part C

Each question carries 12 *marks.*

11. What is difference between time and space complexity. Also describe asymptotic notations used for describing the complexity.

Or

12. Solve the following recurrence relations.
    i) T(n)= 2T(n/2)+n log n ii) T(n)= 2T(n/3)+T(2n/3)+Cn

13. Explain merge sort algorithm and find the complexity of the algorithm.

Or

14. Explain the algorithm for finding maximum and minimum, and analyse its time complexity.
15. Explain Kruskal's algorithm and its complexities.Analyse it with an example.

Or

16. Explain how to solve travelling salesman problem by the method of dynamic programming and analyse complexity of the algorithm.
17. State the 15 puzzle problem. How it is solved? What is the best method to solve the problem in terms of complexity?

Or

18. How to solve the sum of subset problem with explanation of its time complexity.
19. Prove that any algorithm that works by comparing keys to find the second largest from a set of n keys must do at least n+log n-2 comparisons in the worst case.

Or

20. Define string matching problem and describe any string matching algorithm in detail.

(5 x 12 = 60 marks)