G 2582 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2008

Sixth Semester

Branch—Computer Science and Engineering

ALGORITHM ANALYSIS AND DESIGN (R)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Define the ∅ (omega) notation of a function $f(n)$.
2. For the given function, what is $\ominus f(n) = \left(n^3/1000\right) - 100n^2 - 100n + 3$?
3. How to evaluate the complexity of matrix multiplication ?
4. Define the stability of sorting method.
5. What is application of Minimum cost spanning tree ?
6. Explain various types of Knapsack problems.
7. Define Principle of optimality.
8. Explain complexity of the 'k^{th}' element selection.
9. What is dynamic programming strategy ?
10. Define Bounding function.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. If $S_1, S_2, S_3, \ldots S_k$ be set of integers in the range 1 to n. Sum of cardinalities of 'S_i's is 'n'. Then find $0(\hat{n})$ algorithm to sort the "S_i" s.

Or

12. Explain the function of Recurrence Relation and Recurrence Trees for complexity evaluation.

Turn over

13. Show the various steps involved in the Quick sorting of (1, 3, 4, – 5, 9, 2, 6, 5, 3).

Or

14. Design an algorithm to evaluate the upper and lower bounds in heap sort. Explain with typical example.

15. Solve knapsack problem for $n = 3$, $m = 20$, $(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$. Suggest feasible solutions.

Or

16. Explain the Prim's algorithm and give its complexity.

17. Design an algorithm for mergsorting.

Or

18. Explain how to solve the Travelling salesman problem by the Dynamic programming Approach.

19. Explain an Algorithm to solve the "N" Queens problem.

Or

20. How to solve the sum of subsets problem by method of Backtracking ?

(5 × 12 = 60 marks)