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B.E / B.Tech (FT ) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

COMPUTER SCIENCE and ENGINEERING  
IV Semester

CS 8401 & Design and Analysis of Algorithms  
(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define asymptotic notations for representing algorithm complexity
2. Differentiate algorithm from program.
3. What do you mean by Principle of Optimality?
4. State one data structure suitable for divide and conquer strategy
5. Define n-Queens problem.
6. What is Hamiltonian circuit?
7. When do you say a sequence of numbers as bitonic?
8. State the hierarchy of various PRAM models.
9. Define NP class problems.
10. When is a decision problem said to be polynomially reducible?

PART- B ( 5 x 16 = 80 Marks)  
(Question No.11 is Compulsory)



11. Write and explain algorithms for solving the following problems  
i) Finding convex hull over a set of n points ii) Stassen's Matrix Multiplication.
12. a) Write the divide and conquer algorithm for sorting a list of n values using merging operations. Explain with an example.  
(OR)  
b) Define Spanning tree. Discuss the steps in detail to construct minimum spanning tree using Prim's algorithm, with an example.
13. a) Define graph coloring and write a backtracking algorithm for the same  
(OR)  
b) Explain the branch and bound algorithm for solving knapsack problem
14. a) Explain Boyer-Moore string matching algorithm for finding a pattern on a text, and analyze the algorithm for the given input  
Text: abacaabacac                      Pattern: abaca  
(OR)  
b) Sort the following list using (i) odd even merge sort and (ii) 2D-mesh  
50, 9, 42, 15, 14, 20, 11, 12, 6, 21, 8, 33, 5, 13, 7, 30.
15. a) Briefly explain vertex cover problem and why it is NP complete.  
(OR)  
b) Prove that Hamiltonian cycle problem is NP-Complete.