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Question Paper Code : X60376

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Fourth Semester
Computer Science and Engineering
CS 2251/CS 41/CS 1251/080230013/10144 CS 402 – DESIGN AND ANALYSIS
OF ALGORITHMS
(Regulations 2008/2010)
(Common to PTCS 2251 – Design and Analysis of Algorithms
for B.E. (Part – Time) Third Semester – Computer Science and Engineering –
Regulations 2009)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Define theta notation.
2. What is meant by substitution method ?
3. What is the draw back of greedy algorithm ?
4. What is the time complexity of binary search ?
5. Define multistage graphs.
6. What is knapsack problem ?
7. What are explicit constraints and implicit constraints ?
8. What is a Hamiltonian cycle ?
9. Define connected components.
10. Compare NP-hard and NP-completeness.



11. a) Discuss the properties of big Oh notation. **(16)**

(OR)

b) With an example, explain how recurrence equations are solved. **(16)**

12. a) Explain divide-and-conquer method with merge sort algorithm. Give an example.

(OR)

b) Explain how greedy method can be applied to solve the knapsack problem.

13. a) i) Explain the multistage graph problem with an example. **(8)**

ii) Write dynamic programming solution for the traveling sales person problem for the network with the cost adjacency matrix. **(8)**

0	10	15	30
4	0	9	11
5	13	0	10
7	7	8	0

Assume node 1 as the home city.

(OR)

b) Describe all pairs shortest path problem and write procedure to compute lengths of shortest paths. **(16)**

14. a) i) Draw and explain the dynamic state space tree for four-queens problem. **(10)**

ii) How do you estimate the efficiency of backtracking ? **(6)**

(OR)

b) What is graph coloring ? Explain the algorithm with suitable example. Mention some practical applications of graph coloring problem.

15. a) i) Write notes on deterministic and non-deterministic algorithms. **(8)**

ii) Define spanning tree. Discuss the design steps in Kruskal algorithm to construct minimum spanning tree with example. **(8)**

(OR)

b) i) Compare Backtracking Branch and Bound techniques with example. **(8)**

ii) With suitable sample graph, explain the breadth first search and depth first search algorithm. **(8)**