VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
M.C.A. (CBCS) IV-Semester Main Examinations, May/June-2018
Design and Analysis of Algorithms

Time: **3 hours**   Max. Marks: **70**

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Define time complexity.
2. Define the Weighting rule for Union (i, j).
3. Give a solution based on Greedy method for knapsack problem.
4. Give an algorithm to find minimum element from a given array.
5. Write about optimal binary search trees.
6. Give an example of a graph which is not Biconnected.
7. What are the various techniques that can be used to solve Traveling Salesman Problem?
8. What is graph coloring problem?
9. Define NP-Complete class.
10. List few graph problems which are NP-Hard.

Part-B (5 × 10 = 50 Marks)

11. a) Explain about Performance Measurement. [5]
    b) Give a max heap consisting of the following elements: {10,25,8,22,2,7,1,16} [5]

12. a) Explain Prim's algorithm to compute Minimum Spanning Tree (MST). [4]
    b) For the given graph, find the Minimum Spanning Tree using Prim's algorithm. [6]

13. a) Write about reliability design. [5]
    b) Write an algorithm to find All Pairs of Shortest Paths. [5]

14. a) Describe about 8-Queens problem. [6]
    b) Explain about Least Cost search method. [4]

15. a) Is 'node cover decision problem' NP-Hard? Justify your answer. [7]
    b) Explain about importance of Cook's theorem. [3]

16. a) Give an algorithm to find GCD and compute its time complexity. [5]
    b) Explain an algorithm for job sequencing with deadlines using your own example. [5]

17. Answer any *two* of the following:
    a) Considering the graph given in the Question No. 12(b), give DFS result of this graph. [5]
    b) What are the differences between 'Backtracking' and 'Branch and Bound' [5]
    c) Write about directed Hamiltonian cycle with example. [5]

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