Reg. No. | | | | | | | | | | | | |

Question Paper Code : 57249

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Third/Fourth Semester

Computer Science and Engineering

CS 6402 – DESIGN AND ANALYSIS OF ALGORITHMS

(Regulations 2013)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Give the Euclid's algorithm for computing gcd (m, n).
2. Compare the orders of growth of $n(n-1)/2$ and n^2.
3. Give the general strategy of Divide and Conquer Method.
4. What is the closest -pair problem ?
5. Define the Single Source Shortest Paths Problem.
6. State the assignment Problem.
7. What is a state space graph ?
8. State Extreme Point Theorem.
9. Give the purpose of lower bound.
10. What is Euclidean minimum spanning tree problem ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Give the definition and Graphical Representation of O-Notation. **(8)**

(ii) Give the algorithm to check whether all the elements in a given array of n elements are distinct. Find Worst case complexity of the same. **(8)**

OR

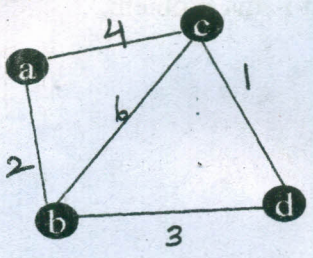
(b) Give the recursive Algorithm for finding the number of binary digits in n's binary representation, where n is a positive decimal integer. Find the recurrence relation and complexity. **(16)**

12. (a) State and Explain the Merge Sort algorithm and Give the recurrence relation and efficiency. **(16)**

OR

(b) Explain the method used for performing Multiplication of two large integers. Explain how Divide Conquer Method can be used to solve the same. **(16)**

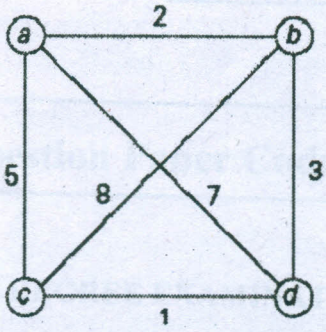
13. (a) Discuss about the algorithm and Pseudocode to find the Minimum Spanning Tree using Prim's Algorithm . Find the Minimum Spanning tree for the graph shown below.



And Discuss about the efficiency of the Algorithm. **(16)**

OR

(b) Find all the Solution to the travelling salesman problem (cities and distances shown below) by exhaustive search. Give the optimal solution. **(16)**

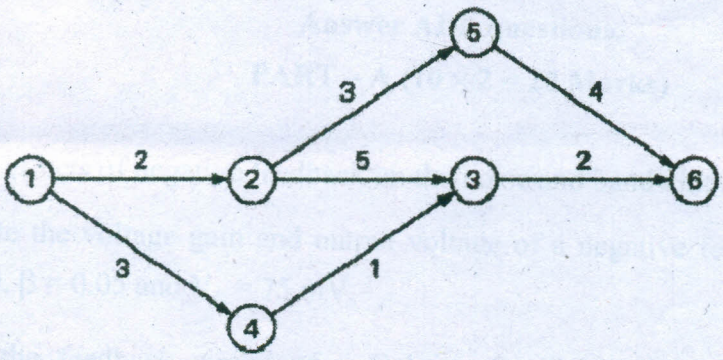


14. (a) (i) Summarize the simplex method. **(8)**

(ii) State and prove Max-Flow Min-Cut Theorem **(8)**

OR

(b) Apply the shortest-augmenting-path algorithm to the network shown below. **(16)**



15. (a) Give any five undecidable problems and explain the famous halting Problem. **(16)**

OR

(b) State the subset-sum problem and Complete state-space tree of the backtracking algorithm applied to the instance A = {3, 5, 6, 7} and d = 15 of the subset-sum problem. **(16)**
