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 ?

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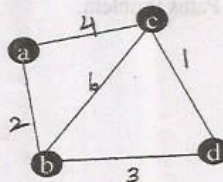
    And Discuss about the efficiency of the Algorithm. (16)
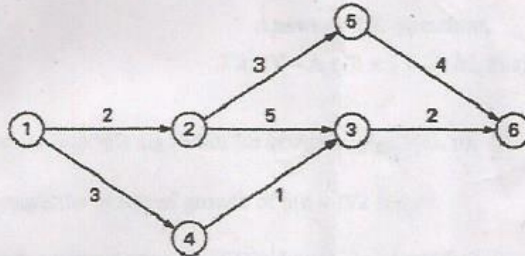
    OR

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(b) Find all the Solution to the travelling salesman problem (cities and distances shown below) by exhaustive search. Give the optimal solution. **(16)**
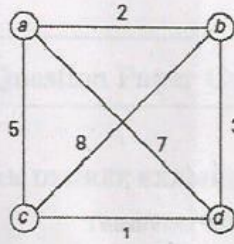
14. (a) (i) Summarize the simplex method. **(8)**

(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)**

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