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Question Paper Code: 54203

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Computer Science and Engineering

15UCS403- DESIGN AND ANALYSIS OF ALGORITHMS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The desirable characteristics of an algorithm is CO1- R
 - (a) Generality
 - (b) Simplicity
 - (c) Time and space efficiency
 - (d) All of the above
2. _____ is a remarkably efficient algorithm for searching in a _____. CO2- R
 - (a) Binary Search, sorted array
 - (b) Binary Search, Unsorted array
 - (c) Linear Search, Sorted array
 - (d) None of the above
3. _____ is simply a brute-force approach to combinatorial problems. CO3- R
 - (a) Exhaustive search
 - (b) Permutations
 - (c) Hamiltonian circuit
 - (d) None of the above
4. The best-known algorithm for the single-source shortest-paths problem, called CO4-R
 - (a) Dijkstra's algorithm
 - (b) Prims Algorithm
 - (c) Kruskal's algorithm
 - (d) None of the above
5. A _____ can tell us how much improvement we can hope to achieve in our quest for a better algorithm for the problem in question. CO5- R
 - (a) Upper bound
 - (b) Lower bound
 - (c) Tight
 - (d) Trival lower bounds

PART – B (5 x 3= 15 Marks)

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|-----|---|--------|
| 6. | State and explain Weighted Graphs | CO1- R |
| 7. | What is the complexity bubble sort. | CO1- U |
| 8. | What does dynamic programming have in common with divide-and-conquer?
What is a principal difference between them? | CO3- U |
| 9. | What is maximum flow problem? | CO4- R |
| 10. | What is blocking pair in stable marriage matching problem. | CO5- U |

PART – C (5 x 16= 80 Marks)

11. (a) Discuss the mathematical analysis of recursive algorithm using a neat example. CO1- App (16)

Or

- (b) Explain Quickser algorithm in detail with its complexity analysis. CO1- App (16)

12. (a) 1. Explain insertion sort algorithm with its efficiency analysis in detail. CO2- U (16)

2. Apply merge-sort for the following elements and find its efficiency

8, 3, 6, 2, 9, 12, 4, 6, 7, 10

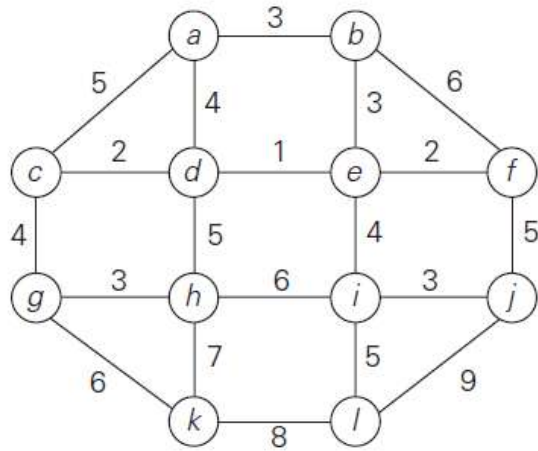
Or

- (b) Explain the various algorithms for generating combinational objects. CO2- U (16)

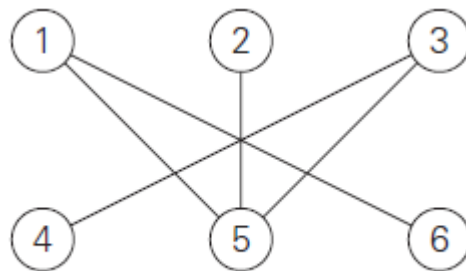
13. (a) Explain how Floyd's algorithm find the shortest path between all the possible pair of vertices with analysis. CO3- Ana (16)

Or

- (b) Apply Kruskal's algorithm to find a minimum spanning tree of the following graph CO3- Ana (16)

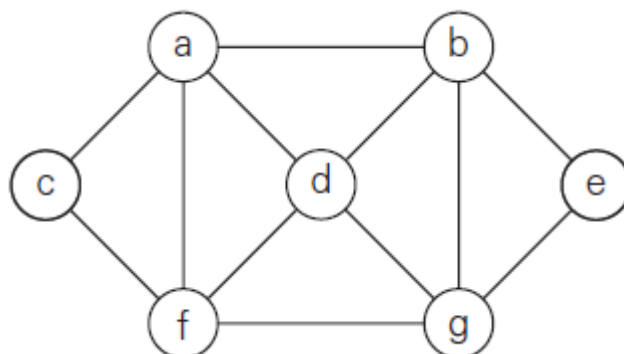


14. (a) Apply the maximum-matching algorithm to the following bipartite graph: (16)



Or

- (b) Explain how linear programming is solved by simplex method. CO4- Ana (16)
15. (a) Apply backtracking to the problem of finding a Hamiltonian circuit in the following graph CO5- U (16)



Or

- (b) Explain how the board's symmetry can be used to find the second solution to the four-queens problem CO5- U (16)

