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Question Paper Code: 44802

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Fourth Semester

Information Technology

14UIT402 - ANALYSIS AND DESIGN OF ALGORITHMS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The asymptotic notation for defining the average time complexity is
 - Equivalence
 - Reflexive
 - Symmetric
 - Both (b) and (c) above
- The _____ of an algorithm is the amount of memory it needs to run to completion.
 - Space Complexity
 - Time Complexity
 - Best Case
 - Worst Case
- _____ is the type of the algorithm used in solving the 8 Queens problem
 - Backtracking
 - Branch and Bound
 - Dynamic
 - Divide and Conquer
- Recursive algorithms are based on
 - Divide and conquer approach
 - Bottom-up approach
 - Top-down approach
 - Hierarchical approach

5. The Sorting method which is used for external sort is
- (a) Bubble sort (b) Quick sort
(c) Merge sort (d) Radix sort
6. The Sorting method which is used for external sort is
- (a) Bubble sort (b) Quick sort
(c) Merge sort (d) Radix sort
7. _____ is an algorithm design method that can be used when the solution to a problem can be viewed as the result of a sequence of decisions.
- (a) Dynamic programming (b) Backtracking
(c) Branch and bound (d) Greedy method
8. For a directed graph $G=(V,E)$; V is the vertices and E is the edges, the Floyd-Warshall algorithm, runs in
- (a) $O(V^3)$ (b) $O(V^2)$ (c) $O(E^3)$ (d) $O(V+E)$
9. The Kruskal algorithm finds the
- (a) Minimum cost spanning tree (b) Shortest path
(c) Longest path (d) none of these
10. The total number of solutions possible for 8-Queen problem is
- (a) 78 (b) 98 (c) 66 (d) 92

PART - B (5 x 2 = 10 Marks)

11. Define algorithm.
12. Write an algorithm to find the number of binary digits in the binary representation of a positive decimal integer.
13. What are AVL trees?
14. Write a recursive algorithm to find factorial for the given number?
15. Differentiate back-tracking and branch and bound.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about the fundamentals of algorithmic solving techniques. (16)

Or

(b) Explain the various Asymptotic Notations and basic efficiency classes. (16)

17. (a) Discuss the mathematical analysis of recursive algorithm. (16)

Or

(b) Explain about the empirical analysis framework for analyzing the algorithm efficiency. (16)

18. (a) (i) Write an algorithm for Quick sort and write its time complexity. (8)

(ii) Apply quick sort to the list 5, 3, 1, 9, 8, 2, 4, 7. (8)

Or

(b) Explain a search procedure using divide and conquer technique. Prove that the procedure works correctly. Give the time complexity of the algorithm. (16)

19. (a) Describe Prim's algorithm with a neat example. Discuss how greedy technique is incorporated in it. (16)

Or

(b) Explain briefly Warshall's and Floyd's algorithm. (16)

20. (a) Explain Knapsack problem in detail with an example problem. (16)

Or

(b) How will you solve travelling salesman problem? Explain the procedure involved in it. (16)
