Reg. No. :

Question Paper Code: 44802

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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)

1. Given $T(n)=5n^2+3n^3+100$, the upper bound for the T(n) is

    (a) $O(n^2)$ (b) $O(n^3)$ (c) $O(n)$ (d) none of these

2. The asymptotic notation for defining the average time complexity is

    (a) Equivalence   (b) Symmetric
    (c) Reflexive   (d) Both (b) and (c)

3. _____ is the type of the algorithm used in solving the 8 Queens problem

    (a) Backtracking   (b) Dynamic
    (c) Branch and Bound   (d) Divide and Conquer

4. The time complexity of Matrix multiplication algorithm is

    (a) $O(n)$ (b) $O(n^2)$ (c) $O(n^3)$ (d) $O(\log n)$

5. The complexity of merge sort algorithm is

    (a) $O(n)$ (b) $O(n2)$ (c) $O(\log n)$ (d) $O(n \log n)$

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. The total running time of optimal binary search tree of n nodes

    (a) $O(n^2)$ (b) $O(n)$ (c) $O(n^3)$ (d) $O(n \log n)$

9. A _____ is a round trip path along *n* edges of *G* that visits every vertex once and returns to its starting position.

    (a) MST   (b) TSP

    (c) Multistage graph   (d) Hamiltonian cycle

10. The total number of solutions possible for8-Queen problem is

    (a) 78   (b) 98   (c) 66   (d) 92

PART - B (5 x 2 = 10 Marks)

11. Define algorithm.

12. What is the worst case, best case, average case for a linear search algorithm?

13. What are AVL trees?

14. What is Greedy technique?

15. Compare Backtracking, Branch and Bound Techniques.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the types of algorithm strategies. Give a short description of problem types. (16)

Or

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

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

Or

(b) Explain the Mathematical Analysis of Recursive algorithms in detail. (16)

18. (a) What is divide and conquer strategy and explain the quick sort with suitable example. (16)

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) Write the Kruskal's Algorithm and apply it to an example graph and find the shortest path. (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) Explain how branch and bound strategy is used in solving Knapsack problem. (16)

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