Reg. No. :

Question Paper Code: 44082

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

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. The _____ of an algorithm is the amount of memory it needs to run to completion.

    (a) Space Complexity   (b) Best Case
    (c) Time Complexity   (d) Worst Case

2. 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

3. Recursive algorithms are based on

    (a) Divide and conquer approach   (b) Top-down approach
    (c) Bottom-up approach   (d) Hierarchical approach

4. Balanced Search trees

    (a) AVL trees   (b) Red Black Trees   (c) B-Trees   (d) All the above

5. BFS is best compared to DFS in the case of

    (a) The graph's width is large   (b) The graph's depth is large
    (c) The graph consists of many nodes (d) The graph is complex

6. Fractional Knap Sack can be effectively solved using

   (a) Greedy Technique   (b) Dynamic Programming

   (c) Brute Force   (d) none of these

7. The output of Kruskal and Prims algorithm is

   (a) Maximum spanning tree   (b) Spanning tree

   (c) Minimum spanning tree   (d) None of the above

8. Which design strategy stops the execution when it find the solution otherwise starts the problem from top

   (a)Back tracking   (b)Branch and Bound

   (c)Divide and conquer   (d)Dynamic programming

9. The Knapsack problem where the objective function is to minimize the profit is

   (a) Greedy   (b) Dynamic 0 / 1

   (c) Back tracking   (d) Branch and Bound 0/1

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. Write an algorithm for bubble sort and give its upper bound.

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 the difference between Greedy method and dynamic programming.

15. Differentiate back-tracking and branch and bound.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain briefly Big Oh notation, Omega notation and Sigma notation. Give examples.   (16)

Or

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

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17. (a) Discuss the following.

      (i) Fundamental concepts of algorithmic solving   (8)

      (ii) Mathematical analysis of recursive algorithm   (8)

Or

  (b) Explain the breadth first search and depth first search with an example.   (16)

18. (a) Write an algorithm for selection sort and insertion sort. compare and analysis it's running time efficiencies.   (16)

Or

  (b) What is divide and conquer strategy and explain the quick sort with suitable example?   (16)

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

Or

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

20. (a) Write an algorithm to solve subset-sum problem using backtracking concept.   (16)

Or

  (b) Explain the concept of Back-tracking and Branch and Bound technique with suitable example.   (16)

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