

(6 pages)

Reg. No. : .....

Code No. : 7914

Sub. Code : PCSM 11

M.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2019.

First Semester

Computer Science – Core

DESIGN AND ANALYSIS OF ALGORITHMS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ( $10 \times 1 = 10$  marks)

Answer ALL questions

Choose the correct answer :

1. Two main measures for the efficiency of an algorithm are \_\_\_\_\_.  
(a) Processor and memory  
(b) Complexity and capacity  
(c) Time and space  
(d) Data and space

2. The space factor when determining the efficiency of algorithm is measured by \_\_\_\_\_.  
(a) Counting the maximum memory needed by the algorithm  
(b) Counting the minimum memory needed by the algorithm  
(c) Counting the average memory needed by the algorithm  
(d) Counting the maximum disk space needed by the algorithm
3. In stack terminology, the insertion operation is defined to be \_\_\_\_\_.  
(a) INSERT operation (b) EDIT operation  
(c) PUSH operation (d) POP operation
4. The operation of processing each element in the list is known as \_\_\_\_\_.  
(a) Sorting (b) Merging  
(c) Inserting (d) Traversal
5. Which of the following technique is not using for solve a 0-1 knapsack problem?  
(a) Greedy  
(b) Dynamic programming  
(c) Branch and Bound  
(d) all of the above

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6. Quick sort is solved using \_\_\_\_\_.  
(a) Divide and conquer  
(b) Greedy Programming  
(c) Dynamic Programming  
(d) Branch and bound
7. Sorting is not possible by using which of the following methods?  
(a) Insertion (b) Selection  
(c) Deletion (d) Exchange
8. What is the type of the algorithm used in solving the 8 Queens problem?  
(a) Greedy (b) Dynamic  
(c) Branch and Bound (d) Backtracking
9. The algorithm like Quick sort does not require extra memory for carrying out the sorting procedure. This technique is called \_\_\_\_\_.  
(a) in-place (b) stable  
(c) unstable (d) in-partition
10. 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.

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**PART B — (5 × 5 = 25 marks)**

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What is an algorithm? Write down the properties to satisfy an algorithm.

Or

- (b) Explain the various asymptotic notations with the properties

12. (a) Write an algorithm for control abstraction for divide and conquer.

Or

- (b) Write an algorithm for recursive binary search.

13. (a) What is the aim of Greedy method? Give an example.

Or

- (b) Write an algorithm for the knapsack problem using greedy method.

14. (a) Explain about the graph coloring problem.

Or

- (b) Explain the Hamiltonian Circuit problem in an undirected Graph.

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15. (a) Define: Branch-and-Bound method. Give an example.

Or

- (b) What is 0/1 knapsack problem? Give an example.

PART C — ( $5 \times 8 = 40$  marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Define time complexity and space complexity. Write an algorithm for adding "n" natural numbers and find the time and space required by that algorithm.

Or

- (b) Define a stack. Describe ways to implement stack.

17. (a) Write a binary search algorithm and explain with examples.

Or

- (b) Write down the algorithm of quick sort and explain it.

18. (a) Discuss the design steps in Kruskal algorithm to construct minimum spanning tree with example.

Or

- (b) Explain about the traveling salesman problem using dynamic programming.

19. (a) Compare and contrast the depth first search and breadth first search.

Or

- (b) Discuss in detail about the 8-Queen problem using backtracking method.

20. (a) Explain the FIFO branch and bound method.

Or

- (b) Describe about the least cost search method.

