

(6 pages)

Reg. No. :

Code No. : 9088

Sub. Code : PCSM 11

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2017.

First Semester

Computer Science

DESIGN AND ANALYSIS OF ALGORITHMS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. A finite set of instructions that if followed, accomplishes a particular task
 - (a) class
 - (b) file
 - (c) algorithm
 - (d) None of the above

2. The _____ of a tree is the maximum degree of the nodes in the tree.
 - (a) Degree
 - (b) path
 - (c) Ancestor
 - (d) Queue
3. The result of prim's algorithm is a total time bound of
 - (a) $O(\log n)$
 - (B) $O(m \log n)$
 - (c) $O(mn)$
 - (d) $O(m + n \log n)$
4. The sum of the distance of all external nodes from the root is
 - (a) Distance
 - (b) Internal path length
 - (c) External path length
 - (d) None
5. A graph in which each branch is given a numerical weight is known as
 - (a) Directed graph
 - (b) Weighted graph
 - (c) Multi graph
 - (d) None

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6. An algorithm used for traversing or searching a tree or a graph data structure which starts from the root is known as
(a) Breadth first search (b) Depth First search
(c) Traversal (d) Biconnected graph
7. _____ is a cycle that visits each vertex exactly once is.
(a) recursive (b) multi graph
(c) tree (d) Hamiltonian cycle.
8. An algorithm design which is generally used for solving combinatorial optimization problems.
(a) Branch and Bound algorithm
(b) Prims algorithm
(c) Greedy algorithm
(d) none
9. A _____ terminates unsuccessfully if and only if there exists no set of choices leading to a success signal.
(a) Graph
(b) Deterministic Algorithms
(c) Non-Deterministic Algorithms
(d) Biconnected components

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10. The quick sort algorithm will take the average time of _____ on n elements
(a) $O(n)$ (b) $O(n^2)$
(c) $O(n \log n)$ (d) None

PART B — ($5 \times 5 = 25$ marks)

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

Each answer should not exceed 250 words.

11. (a) Explain about Algorithms and its criteria.
Or
(b) Write the algorithm for Fibonacci numbers.
12. (a) Write the Control abstraction algorithm for Divide and Conquer method.
Or
(b) Discuss about quick sort algorithm.
13. (a) Discuss about the knapsack problem.
Or
(b) Explain about multi stage graph with example.

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14. (a) Give a note on Graph coloring.

Or

- (b) Discuss about Breadth First Search and traversal.

15. (a) Explain Least cost search.

Or

- (b) Discuss about Nondeterministic algorithms.

PART C — ($5 \times 8 = 40$ marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss about Binary Trees.

Or

- (b) Write a detailed note on Recursive algorithms.

17. (a) Write and explain the algorithms for finding the maximum and minimum values in a set of elements.

Or

- (b) Write short notes on Strassen's Matrix Multiplication.

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18. (a) Discuss about greedy algorithm to generate shortest paths.

Or

- (b) Write a brief note on Asymptotic Notation.

19. (a) Explain Preorder and Postorder traversals with algorithm.

Or

- (b) Write notes on BackTracking.

20. (a) Explain the Cook's theorem.

Or

- (b) Give a brief note on Job shop scheduling.

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