

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc(SS) DEGREE EXAMINATION DECEMBER 2023
(Fifth Semester)

Branch – SOFTWARE SYSTEMS (Five Years Integrated)

DESIGN & ANALYSIS OF ALGORITHMS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

- 1 Which of the following sorting algorithms has a worst-case time complexity of $O(n^2)$?
(i) Merge sort (ii) Quick sort
(iii) Heap sort (iv) Bubble sort
- 2 Why to prefer splay trees?
(i) quick searching (ii) easy to program and faster access
(iii) less time complexity (iv) space efficiency
- 3 Which of the following methods is the most effective for picking the pivot element?
(i) first element (ii) last element
(iii) median of three partitioning (iv) random element
- 4 Backtracking may lead to a solution that is
(i) optimal (ii) sub optimal
(iii) efficient (iv) deterministic
- 5 Which concept simplifies the task of writing the large programs
(i) Divide and conquer (ii) Modularity
(iii) Time complexity (iv) Partitioning

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a. Explain the important aspects of algorithm design.
OR
b. Prepare points related to AVL trees.
- 7 a. State the features of amortized analysis in splay trees.
OR
b. Assess the nature of B trees.
- 8 a. Mention the steps of merge sort working rules.
OR
b. Illustrate the working procedure of Huff-man coding.
- 9 a. Develop a note on dynamic programming.
OR
b. Prepare a note on Hamilton cycle.
- 10 a. How to solve travelling sales man problem using branch& bound technique?
OR
b. What is Cook's theorem and explain its significance?

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a. Analyze the facts behind the “Analysis of sorting algorithms”.
OR
b. Develop a detail note related to the insertion and deletion of elements in trees.
- 12 a. Make a survey on splay trees in detail.
OR
b. Derive the working procedure of M-way search trees.
- 13 a. Explain Strassen’s Matrix Multiplication Algorithm.
OR
b. Make a view on Minimum cost spanning tree.
- 14 a. Interpret the traveling salesman problem in your own words.
OR
b. Solve Eight queen problem using back tracking.
- 15 a. Bring out the features of Branch and bound methods
OR
b. Narrate a detail note on Non-deterministic algorithms.

Z-Z-Z

END