

Course Code: 18CS6T18

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU  
(AUTONOMOUS)  
III-B.Tech II-Semester Supplementary Examinations (BR18), Sept-2023  
DESIGN AND ANALYSIS OF ALGORITHMS (CSE)

Time: 3 hours

Max. Marks: 60

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*Question Paper consists of Part-A and Part-B  
Answer ALL the question in Part-A  
Answer any FOUR Questions from Part-B*  
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PART-A (6X2 = 12M)

1. a) Describe the time complexity and its example? (2M)
- b) What are the steps in quick sort? (2M)
- c) What is the time complexity of single source shortest path? (2M)
- d) What is the time complexity of matrix chain multiplication using dynamic programming approach? (2M)
- e) Is subset sum NP hard? (2M)
- f) How to check if an instance of 15 puzzle is solvable? (2M)

PART-B (4X12 = 48M)

- 2.a) What does small o notation mean? Difference between Big-O and Little-O Notation. (6M)
- b) What are the 5 Rules of pseudocode? How is pseudocode used in expressing algorithms? (6M)
- 3.a) Write merge sort algorithm and explain it, analyze its time complexity? (6M)
- b) Write defective chessboard algorithm and explain it, analyze its time complexity? (6M)
- 4.a) What is the time complexity of job sequencing with deadlines using greedy algorithm? (6M)
- b) Write the design and analysis of optimal merge pattern and single source shortest path algorithm? (6M)
- 5.a) Explain about general method of Dynamic programming. Explain travelling sales person problem with an example. (6M)
- b) Derive the dynamic recurrence relation for optimal binary search tree. How do you edit a string in dynamic programming? (6M)
- 6.a) What are applications of backtracking? Write control abstraction for Backtracking. Write Backtracking algorithm for solving n-queens problem. (6M)
- b) How do you use a graph to solve a coloring problem? How many colors do you color a graph? (6M)
- 7.a) How to check if an instance of 15 puzzle is solvable? (6M)
- b) Write LC branch and bound algorithms. (6M)

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*2/19/23*