

VBD

**Based
on New
Syllabus**

Based on R.T.M. Nagpur University New Syllabus

DESIGN AND ANALYSIS OF ALGORITHM WITH VIVA-VOCE

S. Bale

SOLVED QUESTION BANK + UNIVERSITY PAPER SOLUTIONS

B.TECH. V SEMESTER

**COMP. SCIENCE ENGG., INFORMATION TECH.,
COMP. TECH., ARTI. INTE., ARTI. INTE. & DATA SCI.
(CSE, IT, CT, AI, AIDS)**

B.TECH. VI SEMESTER

COMPUTER ENGINEERING (CE)

! Xerox center सावधान !

प्रिय विद्यार्थी, VBD की Xerox करने वाले Xerox center की संपूर्ण जानकारी दीजिए और इनाम पाइए।
यदि हमारी जांच में आपके द्वारा दी गई जानकारी सही पाई गई तो आपको 5000/- रुपये का इनाम दिया जाएगा।*
उपरोक्त जानकारी WhatsApp No. 9373644557 या Email id : vbdnagpur@gmail.com पर भेजें।

SYLLABUS**B.Tech. V SEMESTER COMPUTER TECHNOLOGY (CT)****UNIT- I****See Unit-I, II & Appendix of this book**

Algorithm, Properties of Algorithm, Summation of arithmetic and geometric series, Recurrence relations. Solutions of recurrence relations using following techniques: Characteristic equation, Recursion tree method and master method. Asymptotic notations of analysis of algorithms, Time complexity of program segments, Best case and worst case analysis of Insertion sort.

UNIT - II**See Unit-III & IV of this book**

Divide and Conquer Strategy: Binary search, Merge sort, Quick sort, Strassen's matrix multiplication. **Greedy Approach:** Fractional Knapsack Problem, Huffman coding algorithm, Travelling Salesman Problem, Activity Selection Problem, Job sequencing with deadlines problem, Minimum cost spanning trees, Single source shortest path.

UNIT - III**See Unit-IV of this book**

Dynamic Programming Strategy: Longest Common Subsequence, Single source shortest paths, Travelling salesman problem, All pairs shortest path, Matrix Chain Multiplication, Multistage graphs, Optimal binary search trees, 0/1 Knapsack problem.

UNIT - IV**See Unit-V of this book**

Backtracking Strategy: n-Queen's problem, Sum of subsets, Graph coloring, Hamiltonian cycles.

UNIT - V**See Unit-VI of this book**

NP-hard and NP-Complete Problems: Non-deterministic algorithms, NP-hard and NP-complete, decision and optimization problems, Clique, Polynomial Reduction, Cook's theorem, graph based problems on NP Principle.

CONTENTS

(B.Tech. V SEMESTER COMPUTER TECHNOLOGY)

UNIT - I

• Algorithm	P.1-32
• Properties of Algorithm	PS-58
• Summation of arithmetic and geometric series	P.1-7
• Recurrence relations	P.1-9
• Solutions of recurrence relations using following techniques	P.1-18
• Characteristic equation	P.1-18
• Recursion tree method and master method	P.1-10
• Asymptotic notations of analysis of algorithms	P.2-4
• Time complexity of program segments	A-4
• Best case and worst case analysis of Insertion sort	P.PS-3

UNIT - II

• Divide and Conquer Strategy	P.3-10
• Binary search	P.3-12
• Merge sort	P.3-19
• Quick sort	P.3-16
• Strassen's matrix multiplication	P.3-33

Greedy Approach:

• Fractional Knapsack Problem	P.3-39
• Huffman coding algorithm	P.3-57
• Travelling Salesman Problem	P.4-25
• Activity Selection Problem	P.3-38
• Job sequencing with deadlines problem	P.3-43
• Minimum cost spanning trees	P.3-45
• Single source shortest path	P.3-56

UNIT - III

Dynamic Programming Strategy

- Longest Common Subsequence P.4-30
- Single source shortest paths P.4-19
- Travelling salesman problem P.4-25
- All pairs shortest path P.4-15
- Matrix Chain Multiplication P.4-37
- Multistage graphs P.4-11
- Optimal binary search trees P.4-23
- 0/1 Knapsack problem P.4-36

UNIT - IV

Backtracking Strategy:

- n-Queen's problem P.5-22
- Sum of subsets P.5-27
- Graph coloring P.5-22
- Hamiltonian cycles P.5-24

UNIT - V

NP-hard and NP-complete pProblems:

- Non-deterministic algorithms P.6-8
- NP-hard and NP-complete P.6-6
- Decision and Optimization Problems P.6-9
- Clique P.6-12
- Polynomial Reduction P.6-11
- Cook's theorem P.6-10
- Graph based problems on NP Principle P.6-12

SOLVED UNIVERSITY QUESTION PAPERS

WINTER - 14 (CT, CS, IT)

SUMMER - 15, WINTER - 15 (CT)

SUMMER - 15, WINTER - 15 (CS)

SUMMER - 15, WINTER - 15 (IT)

SUMMER - 16, WINTER - 16 (CT)

SUMMER - 16, WINTER - 16 (CS)

SUMMER - 16, WINTER - 16 (IT)

SUMMER - 17, WINTER - 17 (CT)

SUMMER - 17, WINTER - 17 (CS)

SUMMER - 17, WINTER - 17 (IT)

SUMMER - 18, WINTER - 18 (CT)

SUMMER - 18, WINTER - 18 (CS)

SUMMER - 18, WINTER - 18 (IT)

SUMMER - 19, WINTER - 19 (CT)

SUMMER - 19, WINTER - 19 (CS)

SUMMER - 19, WINTER - 19 (IT)

APPENDIX

PS-1 to PS-28

PS-29 to PS-46

PS-47 to PS-62

PS-63 to PS-84

PS-85 to PS-96

PS-97 to PS-114

PS-115 to PS-132

PS-133 to PS-146

PS-147 to PS-162

PS-163 to PS-180

PS-181 to PS-194

PS-195 to PS-212

PS-213 to PS-228

PS-229 to PS-242

PS-243 to PS-260

PS-261 to PS-278

A-1 to A-8