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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-2021

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|---|---------------------------------------|----|
| 1 | a | Write the For LOOP general format. | 2M |
| | b | Define the divide and conquer method. | 2M |
| | c | Define optimal solution. | 2M |
| | d | What is graph coloring? | 2M |
| | e | What is a decision problem? | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

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|---|---|-----|
| 2 | Simplify steps involved in performance analysis with example. | 10M |
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OR

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| 3 | a | Determine in steps of Union and Find algorithms with example. | 5M |
| | b | Explain space complexity in detail. | 5M |

UNIT-II

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| 4 | Summarize an algorithm for quick sort. Provide a complete analysis of quick sort for given set of numbers 12, 33, 23, 43, 44, 55, 64, 77 and 76. | 10M |
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OR

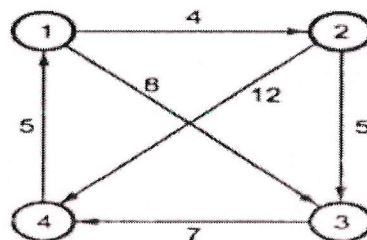
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|---|---|--|----|
| 5 | a | Compare between BFS and DFS techniques. | 5M |
| | b | Solve an algorithm for techniques of binary trees with examples. | 5M |

UNIT-III

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| 6 | a | Explain in detail about greedy method and its applications. | 5M |
| | b | Simplify the algorithm for Knapsack problem and analyze time complexity. | 5M |

OR

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| 7 | Construct an algorithm for All pairs of shortest path and calculate shortest path between all pairs of vertices by using dynamic programming method for the following graph. | 6M
4M |
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**UNIT-IV**

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|---|--|-----|
| 8 | Construct the LC branch and bound search. Consider knapsack instance $n=4$ with capacity $M=15$ such that $p_i=\{10,10,12,18\}$, $w_i=\{2,4,6,9\}$ apply LC branch and bound technique. | 10M |
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OR

- 9 Simplify 0/1 knapsack problem and design an algorithm of LC Branch and Bound and find the solution for the knapsack instance of $n = 4, (p_1, p_2, p_3, p_4) = (10, 10, 12, 18), (w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$ and $M = 15$. 10M

UNIT-V

- 10 Construct the non-deterministic algorithms with example. 10M

OR

- 11 Estimate the strategy to prove that a problem steps of NP-hard. 10M

END

