



R20 Regulation *Subject code:3P4FE*
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)
B.Tech IV Semester Regular Examinations, July 2022

DESIGN AND ANALYSIS OF ALGORITHMS
(INFORMATION TECHNOLOGY)

Maximum Marks: 70

Date:30.07.2022 Duration: 3 hours

- Note:**
- 1.This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

- 1 Evaluate the difference between Time Complexity and Space Complexity.
- 2 List out the applications of divide and conquer method.
- 3 Where are and/or graphs useful?
- 4 Give an example where backtracking can be used to solve the problem.
- 5 What is the spanning tree of a tree?
- 6 Summarize Knapsack problem.
- 7 What is chained matrix multiplication?
- 8 How do you solve all pairs with the shortest path problem?
- 9 State Cook's theorem.
- 10 Differentiate Class P and Class NP problems.

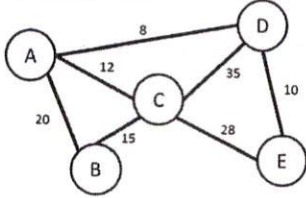
Part-B

Answer All the following questions.

(10MX 5=50Marks)

- 11 Write the algorithm for quick sort. Provide a complete analysis of quick sort for the given set of numbers 12, 33, 23, 43, 44, 55, 64, 77 and 76. (10)
OR
- 12 A. Write an algorithm to perform binary search on a sorted list of elements. (5)
B. Analyze the binary search algorithm for the best case, average case and worst case. (5)
- 13 A. Give a short note on bi-connected components. (5)
B. What is a Hamiltonian cycle? Illustrate how to identify a Hamiltonian cycle. (5)
OR
- 14 Illustrate the procedure for tracking 8 queens problem using backtracking approach. (10)

- 15 For the given graph draw the minimum cost spanning tree. (10)



OR

- 16 Find the best job sequence for the given set of jobs. (10)

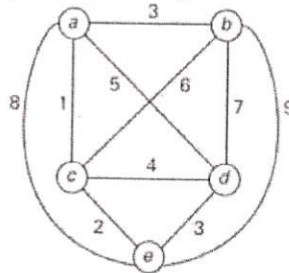
Jobs	J1	J2	J3	J4	J5	J6	J7
Profits	35	30	25	20	15	12	5
Deadlines	3	4	4	2	3	1	2

- 17 Explain the two approaches to solve problems using dynamic programming method. (10)

OR

- 18 Discuss in detail about optimal binary search trees. (10)

- 19 Solve the city travelling salesperson problem using Branch and Bound algorithm. (10)



OR

- 20 A. Compare Deterministic and Non-Deterministic algorithms. (5)
 B. Explain satisfiability problem. (5)