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

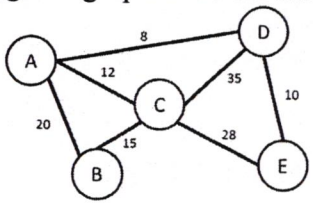
12 A. Write an algorithm to perform binary search on a sorted list of elements. (5)
B. Analyze the binary search algorithm for the best case, average case and worst case. (5)

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)

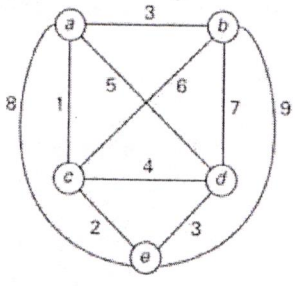
Jobs	J1	J2	J3	J4	J5	J6	J7
Profits	35	30	25	20	15	12	5
Deadlines	3	4	4	2	3	1	2

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)