



R20 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Regular Examinations, July 2022

Subject code: 3P4ED

DESIGN AND ANALYSIS OF ALGORITHMS
(CSE, CSE(AIML) & CSE(DS))

Maximum Marks: 70

Date:28.07.2022 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 Define O-notation. List the properties of Big Oh notation.
- 2 Outline the divide and conquer method.
- 3 What is and/or graph?
- 4 List the properties of spanning tree.
- 5 What do you mean by job sequencing?
- 6 Name the algorithm is used for single source shortest path.
- 7 How do you solve matrix chain multiplication problems?
- 8 Outline the complexity of all pair shortest path algorithm.
- 9 Mention the characteristics of branch bound method.
- 10 Differentiate NP-Hard and NP-Complete problems.

Part-B

Answer All the following questions.

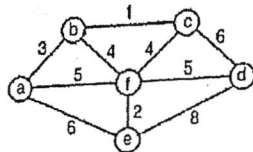
(10MX 5=50Marks)

- 11 A. Discuss in detail about fundamentals of algorithmic problem solving. (5)
B. Give a detailed note on the asymptotic notations. (5)

OR

- 12 Describe matrix multiplication operation using Strassen's method. (10)

- 13 Give the pseudo code for Prim's algorithm and apply the same to find the minimum spanning tree of the graph shown below. (10)



OR

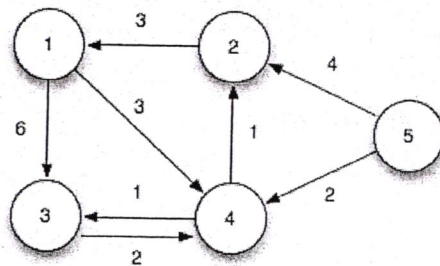
- 14 A. Discuss about the graph coloring problem. (5)
B. How is backtracking method useful in problem solving? Give an example. (5)

- 15 For the given set of items and knapsack capacity = 50 kg, find the optimal solution for the fractional knapsack problem making use of greedy approach. (10)

Item	Weight	Value
1	10	60
2	20	100
3	30	120

OR

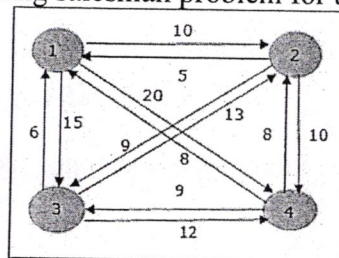
- 16 Find the shortest path for the given graph using single source shortest path algorithm. (10)



- 17 Illustrate the definition for dynamic programming. Explain the characteristics of dynamic programming. (10)

OR

- 18 Solve travelling salesman problem for the given graph using dynamic programming. (10)



- 19 Explain in detail about LIFO, FIFO & LC branch and bound technique. (10)

OR

- 20 Define Class NP. Discuss about any five problems for which no polynomial time algorithm has been found. (10)