R20 Regulation *Subject code: 3P4ED*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, June 2026

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE, CSE(AI&ML) & CSE(DS))

Maximum Marks: 70 Date: 15.06.2026 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.
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)		Marks	CO	BTL
1	What is the binary search?	2M	1	L1
2	What is an algorithm?	2M	1	L1
3	Define a live node.	2M	2	L1
4	Define chromatic number of the graph.	2M	2	L1
5	What is the Greedy approach?	2M	3	L1
6	What is Knapsack problem?	2M	3	L1
7	Define dynamic programming.	2M	4	L1
8	Define multistage graph	2M	4	L1
9	What is class P and NP?	2M	5	L1
10	What is the traveling salesman problem?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) What is an algorithm? Explain its characteristics. b) Explain the Strassen's matrix multiplication.	5M 5M	1	L2
	OR			
12	a) Discuss about space complexity in detail. b) Write an algorithm for quick sort. Explain with an example.	5M 5M	1	L2
13	Write an algorithm for AND/OR Graphs.	10M	2	L2
	OR			
14	a) Explain the 4-queen problem using backtracking. b) Draw the state space tree for m-coloring graph.	5M 5M	2	L2
15	Write an algorithm of Prim's minimum cost spanning tree.	10M	3	L2
	OR			
16	Write a greedy algorithm to the job sequencing with deadlines.	10M	3	L2
17	Explain in detail about Chained matrix multiplication with suitable examples.	10M	4	L2

	OR			
18	Explain in detail about optimal binary search trees with suitable examples.	10M	4	L2
19	State the cook's theorem. What is the significance of this theorem?	10M	5	L2
	OR			
20	Explain the classes of NP-hard and NP-complete.	10M	5	L2