R18 Regulation *Subject code:2P5ED*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, November 2025

DESIGN AND ANALYSIS OF ALGORITHMS

(CSE)

Maximum Marks: 70 Date: 10.11.2025 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	Define Space and Time Complexities?	2M	1	L1
2	Mention the criteria to be satisfied by an algorithm.	2M	1	L1
3	What is an articulation point in a graph? Give two examples.	2M	2	L1
4	Write the algorithms for Collapsing Find.	2M	2	L1
5	What is an optimization Problem? Describe it with an Example.	2M	3	L1
6	Define Spanning tree	2M	3	L1
7	Write the general procedure of dynamic programming.	2M	4	L1
8	Differentiate between tractable and intractable problems.	2M	4	L1
9	What are the differences between backtracking and branch & bound algorithm design Techniques?	2M	5	L1
10	Define P and NP class of problems.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Write an algorithm for Binary Search and analyze its time complexity with an example	10M	1	L2
	OR			
12	Explain Strassen's Matrix Multiplication with an example and calculate its time complexity.	10M	1	L2
13	What is Graph coloring? Write an algorithm and explain with an example.	10M	2	L2
	OR			
14	Write an algorithm to implement 8-Queens Problem. Analyze the algorithm for its space & time complexity.	10M	2	L2
15	Explain the concept of job sequencing with deadlines by Greedy technique. With Example.	10M	3	L2
	OR			
16	Define and explain Prim's Algorithm, give pseudo-code and trace it with a suitable example	10M	3	L2
17	Construct an optimal binary search tree for the given set. Keys = {10,20,30,40} Pi={3,3,1,1} Qi = {2,3,1,1,1}	10M	4	L2

	OR			
18	Write the Bellman and Ford Algorithm to compute shortest paths. And trace it with a suitable example.	10M	4	L2
19	a) Write short notes on non-deterministic algorithms. b) Explain the classes of NP- H & NP-C	5M 5M	5	L2
	OR			
20	Explain the concept of Branch and Bound and its types with suitable example.	10M	5	L2

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