R20 Regulation *Subject code: 3P4FE*

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

(IT)

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.

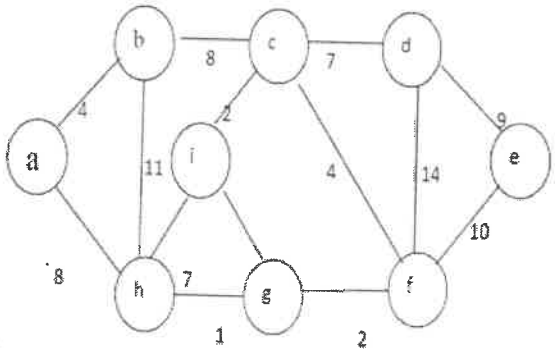
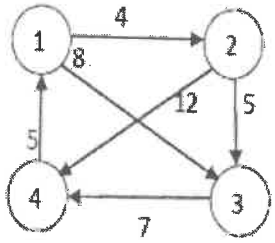
Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	What is an algorithm?	2M	1	L1
2	What are algorithm design techniques?	2M	1	L1
3	What is backtracking?	2M	2	L1
4	What is weighted union?	2M	2	L1
5	What is a minimum spanning tree?	2M	3	L1
6	Write the control abstraction for greedy method.	2M	3	L1
7	Define overlapping subproblems.	2M	4	L1
8	State the methodology of Branch and Bound.	2M	4	L1
9	What is the relation between NP-hard and NP- complete?	2M	5	L1
10	What is LC branch & bound method?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Explain Asymptotic Notations with suitable examples. b) Explain Strassen's matrix multiplications with an example.	5M 5M	1	L2
	OR			
12	Write an algorithm for Binary search using recursive method and sort the following elements? Find the recurrence relation using back substitutional method. 3,6,8,12,14,17,25,29,31,36,42,47,53,55,62.	10M	1	L2
13	a) Identify simple union and simple find operation along with algorithms. b) Utilize general method of back tracking.	5M 5M	2	L2
	OR			
14	Explain 4 queens problem using state space tree.	10M	2	L2
15	Compute optimal binary search tree for the following table:	10M	3	L2

SNO	1	2	3	4
KEYS	10	20	30	40
FREQ	4	2	6	3

	OR			
16	Construct the Job Sequencing with Deadlines algorithm structured? And Can the Job Sequencing with Deadlines algorithm handle jobs with different durations?	10M	3	L2
17	Explain Prim's algorithm and compute minimum cost spanning tree for the graph using prims' algorithm. 	10M	4	L2
	OR			
18	Describe Floyd's algorithm for all pairs shortest path problem. Apply the same to the following weight matrix and discuss its time efficiency. 	10M	4	L2
19	a) Give the 0/1 Knapsack LCBB algorithm. b) Differentiate between deterministic and non deterministic algorithm.	5M 5M	5	L2
	OR			
20	a) Explain the strategy to prove that a problem is NP hard. b) Explain the non-deterministic sorting problem.	5M 5M	5	L2