



TKRCEET
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R20 Regulation

Subject code: 3P4FE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, December 2025

DESIGN AND ANALYSIS OF ALGORITHMS (IT)

Maximum Marks: 70

Date: 23.12.2025

Duration: 3 hours

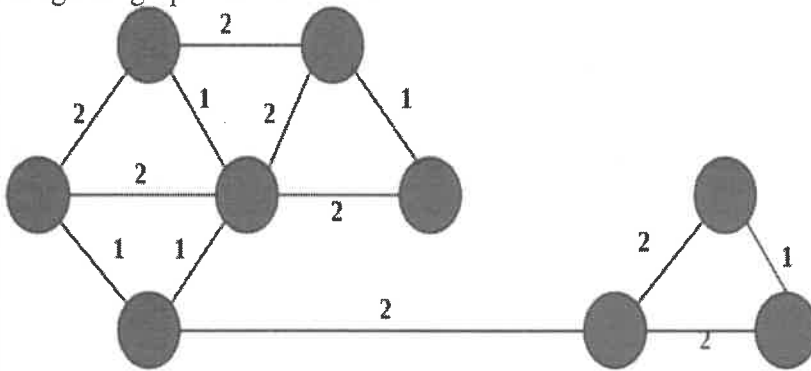
- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	Define Space complexity.	2M	1	L1
2	What is the running time of Strassen's algorithm for matrix multiplication?	2M	1	L1
3	What is backtracking?	2M	2	L1
4	What is AND/OR graphs?	2M	2	L1
5	What is a minimum spanning tree?	2M	3	L1
6	Dynamic programming divided into how many stages and state it.	2M	3	L1
7	Which methods can be used to solve the matrix chain multiplication problem?	2M	4	L1
8	State the methodology of Branch and Bound.	2M	4	L1
9	What is the difference between NP-hard and NP- complete?	2M	5	L1
10	What is a minimum spanning tree?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Build Asymptotic Notations with suitable examples. b) Apply Strassen's matrix multiplications with an example.	5M 5M	1	L2
OR				
12	Construct an algorithm for merge sort using recursive method and sort the following elements. 100,300,150,450,250,350,200,400,500.	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	Construct 8 queens' problem with suitable example.	10M	2	L2

15	<p>Make use of the number of distinct minimum spanning trees for the weighted graph shown below.</p> 	10M	3	L2
OR				
16	<p>Construct the Job Sequencing with Deadlines algorithm structured? And Can the Job Sequencing with Deadlines algorithm handle jobs with different durations?</p>	10M	3	L2
17	<p>a) Apply Matrix Chain Multiplication with an example. b) Apply Reliability design with an example.</p>	5M 5M	4	L2
OR				
18	<p>Explain Floyd's algorithm for all pairs shortest path problem with suitable example.</p>	10M	4	L2
19	<p>Develop the TSP in branch and bound.</p>	10M	5	L2
OR				
20	<p>a) Solve the non-deterministic algorithm. b) Build the classes of NP-hard and NP-complete.</p>	5M 5M	5	L2