R20 Regulation *Subject code: 3P4ED & 3P4FE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, July 2024

DESIGN AND ANALYSIS OF ALGORITHMS

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

Maximum Marks: 70 Date:25.07.2024 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)		CO	Bloom Tx
1	In what way a time complexity differs from space complexity	1	L1
2	What is the worst case complexity in Quick Sort? Why?	1	L1
3	What is an Hamiltonian Cycle. Give two Examples.	2	L1
4	Write any two characteristics of Greedy Algorithm.	2	L1
5	State m-colorability decision problem. Give two examples	3	L1
6	Define Spanning tree	3	L1
7	What you mean by dynamic programming	4	L1
8	List the applications of dynamic programming.	4	L1
9	State the difference between FIFO and LC Branch and Bound algorithms	5	L1
10	Define NP-Hard problems.	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Make use of the recursive and iterative versions of binary search and find the time complexity. For appropriate sizes of n, have each algorithm find every element in the set. Then try all n+1 possible unsuccessful searches. [10M]	1	L3
	OR		
12	Explain and apply strassen's matrix multiplication for an example[10M]	1	L3
13	Explain in detail Sum of Subsets algorithm and develop the possible solution strategies using backtracking for below weights W[1:6]={5,10,12,13,15,18},m=30 [10M]	2	L3
	OR		
14	A) Explain the Find algorithm [5M] B) Solve the optimal solution for 8- queens problem using back tracking [5M]	2	L3

15	Build the optimal solution for job sequencing with deadlines by Greedy technique. With Example. [10M]	3	L3
	OR		
16	Explain Kruskal's Algorithm. Trace and construct the minimum cost spanning tree using the algorithm with suitable example. (10M)	3	L3
17	Construct and assess for an optimal binary search tree for the given set of identifiers. Let n=4, (a1,a2,a3,a4) = (do, if, int, while), p(1:4) = (3,3,1,1) and q(0:4) = (2,3,1,1,1) [10M]	4	L5
	OR		
18	a) Define Reliability Design Problem (3M) b) Choose a reliable three state system with three device types D1, D2 and D3. The costs are \$30,\$15 and \$20 respectively. The cost of system is to no more than \$105. The reliability if each device type is 0.9, 0.8 and 0.5 respectively. (7M)	4	L1 L5
19	a) Write short notes on non-deterministic algorithms. (5M) b) compare the classes of NP- H & NP-C (5M)	5	L4
	OR		
20	Analyse Travelling salesman problem with an example using branch and bound technique (10M)	5	L4