R18

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech II Semester Supplementary Examinations, Jan/Feb-2024
### DESIGN AND ANALYSIS OF ALGORITHMS
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours   **Max. Marks: 75**

Section – A (Short Answer type questions)   (25 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	Define Big Oh, Omega and Theta Notations.	CO1	L1	2M
2.	List the advantages of Divide and Conquer Algorithm	CO1	L1	3M
3.	Define spanning tree.	CO2	L1	2M
4.	What are the drawbacks of Greedy method?	CO2	L1	3M
5.	Write the features of dynamic programming.	CO3	L1	2M
6.	Define optimal binary search tree.	CO3	L1	3M
7.	Differentiate backtracking and branch bound techniques.	CO4	L1	2M
8.	What is a state space tree?	CO4	L1	3M
9.	What are NP-Complete problems?	CO5	L1	2M
10.	Define nondeterministic algorithm.	CO5	L1	3M

Section B (Essay Questions)
**Answer all questions, each question carries equal marks.**   **(5 X 10M = 50M)**

11.A)	How the performance of an algorithm can be analyzed? Explain with example.	CO1	L2	10M
	OR			
B)	Sort the following element by using Merge sort algorithm 17, 19, 13, 16, 12, 9, 14, 18, 6, 15, 22, 27, 8.	CO1	L3	10M
12.A)	Write an algorithm to find whether a graph consists of biconnected components or not.	CO2	L2	10M
	OR			
B)	Construct an optimal solution for Knapsack problem, where n=7, M=15 and $(p_1,p_2,p_3,p_4,p_5,p_6,p_7)=(10,5,15,7,6,18,3)$ and $(w_1,w_2,w_3,w_4,w_5,w_6,w_7)=(2,3,5,7,1,4,1)$ by using Greedy strategy.	CO2	L3	10M
13.A)	Construct an algorithm for All pairs of shortest path and calculate shortest path between all pairs of vertices by using dynamic programming method with an example?	CO3	L2	10M
	OR			
B)	Illustrate a three stage system with device types D1, D2 and D3 The costs are $30, $15, $20 respectively. The cost of the system is to be no more than $105. The reliability of the each device type is 0.9, 0.8 and 0.5 respectively.	CO3	L3	10M

14.A) What is graph coloring problem? Describe the back tracking technique to m-coloring with following planar graph shown in the figure.   CO4   L2   10M
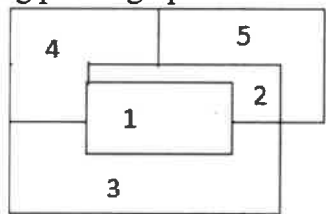
OR

B) Write about Hamiltonian cycle. Draw portion state space tree for the following graph shown in the figure.   CO4   L2   10M
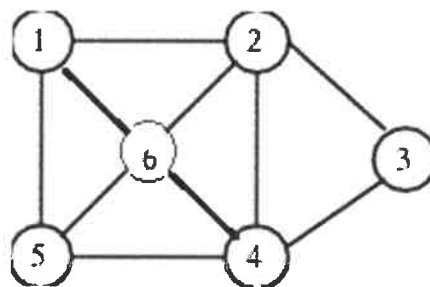
15.A) Distinguish NP-hard and NP-complete problems.   CO5   L2   10M

OR

B) Distinguish between deterministic and non-deterministic algorithms with examples.   CO5   L3   10M