Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER-V EXAMINATION –SUMMER-2020

Subject Code:4659301 Date:04-11-2020

Subject Name:Design & Analysis of Algorithms (DAA)

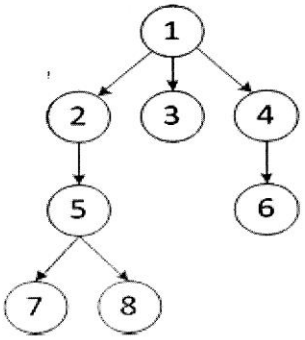
Time:10:30 AM to 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1. (a)	Define the following terms: 1. List down the areas in the study of algorithm. 2. What do you mean by "Efficiency of algorithm". 3. Explain Big-Oh Notation.	**07**
Q.1.(b)	What do you understand by sorting? List various sorting algorithms. Give the comparison of various sorting algorithms in terms of best case, average case and worst case time complexity.	**07**
Q.2. (a)	Compare Greedy method vs Dynamic programming	**07**
Q.2. (b)	What is divide and conquer approach? Give the algorithm for binary search method.	**07**
	OR	
Q.2. (b)	Sort the following data using heap sort. Also give its complexity. A, L, G, O, R, I, T, H, M	**07**
Q.3. (a)	Solve the following knapsack problem using greedy method. Given n =3, M = 50 W = [10, 20, 30], P = [60, 100, 120]	**07**
Q.3. (b)	Write short notes on the following: 1. 4-Queen's problem 2. Scale balancing problem	**07**
	OR	
Q.3. (a)	Solve the following job sequencing problem for the given details of jobs and deadlines. Consider single machine is available for the jobs to be done. N = 4, P = {30, 35, 20, 25} D = {2, 1, 2, 1}	**07**
Q.3. (b)	Briefly explain the following: 1. Hamiltonian circuits 2. 8 puzzle problem	**07**

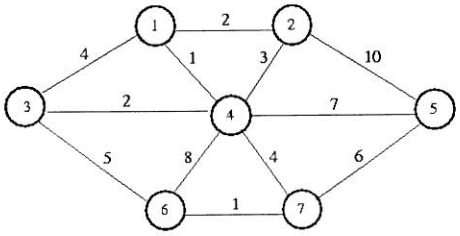
Q.4. (a) Write an algorithm to implement DFS. Given the graph below, give its DFS sequence. **07**



Q.4. (b) Explain matrix chain multiplication briefly using dynamic programming algorithm. **07**

OR

Q.4. (a) What are spanning trees? Solve the following graph using Kruskal's algorithm. **07**



Q.4. (b) Develop an algorithm for Rod-cutting problem using Dynamic Programming algorithm using an example. **07**

Q.5. (a) Write down Dynamic Programming algorithm for Coin Change problem. Using it, solve the following problem: Given: d1 = 1, d2 = 3, d3 = 5, d4 = 6; find the minimum number of coins required to provide the change of Rs. 8. **07**

Q.5. (b) Write a short note on NP-Completeness and NP-Hard Problem. **07**

OR

Q.5. (a) Explain P-type Problem. Write short note on NPC and NP problem. **07**

Q.5. (b) Elaborate Longest Common Subsequence problem with the help of dynamic programming. Support your answer with illustration. **07**