(3 Hours) **Max. Marks: 80**

1. **Question No: 01 is compulsory**
2. **Attempt any three from Q2 to Q6**

Q1 Solve

A	Analyze and solve the recurrence relation for merge sort.	**05**
B	Explain Branch and Bound with an example.	**05**
C	Write Boyer Moore algorithm for String Matching.	**05**
D	How greedy technique is used to Minimum cost spanning tree. Explain	**05**

Q2 Solve

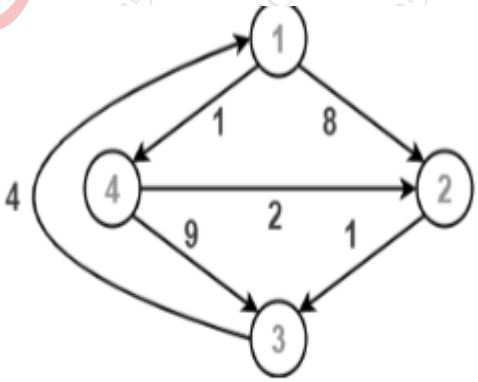
A	What do you mean by Dynamic Programming, write an algorithm to solve Longest common subsequence by using Dynamic Programming approach?	**10**
B	Explain Binary search using divide and conquer Methodology.	**10**

Q3 Solve

A	Write detail Comparative analysis of Merge sort and Quick Sort techniques on the basis of following points: • Working • Space and time complexity • Efficiency	**10**
B	Solve Graph colouring problem using Backtracking technique.	**10**

Q4. Solve

A	Using Floyd Warshall Algorithm, find the shortest path distance between every pair of vertices.	**10**



B	Define NP Hard and NP –complete problem.	**10**

Q5. Solve

A Solve Convex- Hull Problems using quick hull algorithm and Jarvis march algorithm using Divide And Conquer approach. **10**

B Write short note on LIFO Search, FIFO search and Least cost search using Branch and Bound. **10**

Q6. Solve

A Find the LC branch and bound solution for the travelling sales person problem whose cost matrix is as follows. **10**

The cost matrix is

$$\begin{vmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{vmatrix}$$

B Write Rabin-Karp algorithm for string matching, also explain it with an example. **10**