Time:3 Hours **Marks: 80**

N.B.: 1) Question No. 1 is compulsory.
2) Answer any three out of remaining questions.
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks.

Q1 Solve any four.

a) Write a note on the Recursive Algorithm. 5 marks
b) Explain in detail the Red-Black tree. 5 marks
c) Write a note on optimal storage on tape. 5 marks
d) Define & explain the principle of optimality with memoization. 5 marks
e) Explain in detail the Naïve string-matching Algorithm. 5 marks

Q2 a) What is complexity? Explain in detail the master's theorem. 10 Marks

b) Define the B tree and explain in detail the insertion operation for the following sequences 31, 32,33,34,35,36,37,38,39, and 40 and construct the B tree of order four. 10 Marks

Q3a) Write a recursive algorithm for Merge Sort & compute its complexity. 10 Marks

b) What is the sequence of jobs? For following sequence of jobs gives the snapshot of execution which will achieve maximum profit. 10 Marks

Job	1	2	3	4	5	6
Profit	22	17	12	8	7	5
Deadline	3	1	1	3	1	3

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Q4 a) What is divide and conquer strategy? Write an algorithm for Binary Search. 10 Marks
b) Explain the All-pair shortest path algorithm in detail. 10 Marks

Q5 a) Explain in detail the Knatt-Morris-Pratt string matching Algorithm. 10 Marks
b) Explain in detail Matrix Chain Multiplication. 10 Marks

Q6 a) Explain in detail Longest Common Subsequence (LCS) string matching algorithm with example. 10 Marks
b) Explain in detail genetic algorithms. 10 Marks

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