TE - Sem V R-19 C-Scheme INFT Winter 2025
21/11/25

(3 hours) (Marks: 80)

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three out of the remaining five questions.
(3) Assumptions made should be clearly stated.
(4) Figures to the right indicate full marks

Q1 Solve any four (each of 5 marks)
a) Write a note on the Recursive Algorithm.
b) Explain in detail the Red-Black tree.
c) Write a note on optimal merge pattern.
d) Define & explain the principle of optimality with memoization.
e) Explain in detail the Naïve string-matching Algorithm

Q2 a) What is complexity? Explain in detail asymptotic notations. 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 three. 10 Marks

Q3 a) Write a recursive algorithm for quicksort and compute its complexity. 10 Marks
b) What is the sequence of jobs? For following a sequence of jobs gives a snapshot of execution, which will achieve maximum profit. 10 Marks

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

Q4 a) What is divide and conquer strategy? Write an algorithm for Binary Search. 10 Marks
b) Explain the Travelling sales person problem with example 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 the Longest Common Subsequence (LCS) string matching algorithm with an example. 10 Marks
b) Explain in detail genetic algorithms. 10 Marks

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