S1

G. H. RAISONI COLLEGE OF ENGG. NAGPUR

(An Autonomous Institute under UGC Act 1956)

Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<5, 4, 6, 2, 7>

B. Obtaining LCS and length of LCS for below strings:

X=<A, B, C, B, D, A, B>

Y=<B, D, C, A, B, A>

S2

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TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<5, 10, 6, 5>

B. Design and implement job sequencing algorithm to find the maximum profit job sequence for the following jobs with deadlines and profits.

Job	A	B	C	D	E
Deadline	2	1	2	1	3
Profit	100	19	27	25	15

S3

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TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**
Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<1, 2, 3, 4, 5>

B. Generate Longest Common Subsequence and its length for the below set of strings

X=<a,a,b,a,a,b,a,b>

Y=<b,a,b,a,a,a>

S4

G. H. RAISONI COLLEGE OF ENGG. NAGPUR

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**
Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Consider the following set of activities with start and finish times. Select the maximum number of activities that can be performed by a single person, taking only one activity at a time.

Activity	A1	A2	A3	A4	A5	A6
Start Time	0	3	1	5	5	8
Finish Time	6	4	2	9	7	9

B. Obtaining LCS and length of LCS for below strings:

X=<0, 0, 1, 1, 1, 0, 1>

Y=<0, 1, 1, 0, 1, 0, 1>

S5

G. H. RAISONI COLLEGE OF ENGG. NAGPUR

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ **Roll No.:** _____ **Class:**__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<5, 4, 3, 2, 1>

B. Followings are jobs with associated profits and deadlines. It is assumed that every job takes single unit of time. Find the sequence of jobs to maximize the profit.

JOBS	J1	J2	J3	J4	J5	J6	J7
PROFITS	35	30	25	20	40	50	10
DEADLINE	3	4	4	2	3	1	2

S6

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<5, 4, 10, 5, 4>

B. Obtaining LCS and length of LCS for below strings:

X=<0, 0, 1, 1, 1, 0, 1>

Y=<0, 1, 1, 0, 1, 0, 1>

S7

G. H. RAISONI COLLEGE OF ENGG. NAGPUR

(An Autonomous Institute under UGC Act 1956)

Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ **Roll No.:** _____ **Class:**__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<2, 4, 6, 2>

B. Solve Activity Selection problem for set of activities mentioned below with start and finish times of each. List maximum activities scheduled within the time bound of each activity.

i	1	2	3	4	5	6	7	8	9	10	11
s_i	1	3	0	5	3	5	6	8	8	2	12
f_i	4	5	6	7	8	9	10	11	12	13	14

S8

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**
Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Obtaining LCS and length of LCS for below strings:

X=<A, G, G, T, A, B>

Y=<G, X, T, Y, A, B>

B. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<10, 20, 30, 10>

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Find optimal parenthesization of Matrix chain multiplication whose sequence of dimension is

<3, 4, 5, 3>

B. Solve Activity Selection problem for set of activities mentioned below with start and finish times of each. List maximum activities scheduled within the time bound of each activity.

Activity	Start	Finish
a3	1	2
a1	1	3
a2	0	4
a7	3	5
a8	4	5
a4	4	6
a6	5	8
a5	2	9

S10 **G. H. RAISONI COLLEGE OF ENGG. NAGPUR**

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Department of Computer Science & Engg.

TAE-III: Problem Solving **Subject: Design and Analysis of Algorithms**

Time: 60 min **Subject Teacher: Prof. Dipti Theng** **Max Marks: 04**

Name of Student:_____ _____ Roll No.: _____ Class:__ _____

Q. 1. Solve following problems:

A. Given below an array of jobs where every job has a deadline and associated profit if the job is finished before the deadline. It is also given that every job takes single unit of time, so the minimum possible deadline for any job is 1. How to maximize total profit if only one job can be scheduled at a time.

JobID	Deadline	Profit
a	4	20
b	1	10
c	1	40
d	1	30

B. Find an optimal parenthesization of matrix Chain Multiplication whose sequence is

<4,10,3,12,20,7>