



'समानो मन्त्रः समितिः समानी'

**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours 5th Semester Examination, 2022

**DSE-P2-COMPUTER SCIENCE (54L) (PRACTICAL)**

Time Allotted: 2 Hours

Full Marks: 20

**The question paper contains DSE54L:E1L and DSE54L:E2L and DSE54L:E3L.**

**The candidates are required to answer any *one* from *three* courses.**

**Candidates should mention it clearly on the Answer Book.**

**DSE54L:E1L**

**OPERATIONS RESEARCH LAB**

<b>Program</b>	<b>: 10</b>
<b>Viva</b>	<b>: 05</b>
<b>Practical Copy</b>	<b>: 05</b>
<b>Total</b>	<b>: 20</b>

**Answer any *one* question on lottery basis**

1. Write a program to take a matrix as user input and compute its rank and find the value of its determinant.

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2. Maximize:  $P = 1.4X_1 + X_2$

Subject to:  $X_1 \leq 3$

$$2X_1 + X_2 \leq 8$$

$$3X_1 + 4X_2 \leq 24$$

and  $X_1 \geq 0, X_2 \geq 0$

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3. Obtain the initial basic feasible solution of a transportation problem whose cost and rim requirement table is as follows:

Origin\Destination	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Supply
O <sub>1</sub>	2	7	4	5
O <sub>2</sub>	3	3	1	8
O <sub>3</sub>	5	4	7	7
O <sub>4</sub>	1	6	2	14
<b>Demand</b>	7	9	18	34

4. Determine an initial basic feasible solution for the following TP, using the Least Cost Method

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Supply
O <sub>1</sub>	6	4	1	5	14
O <sub>2</sub>	8	9	2	7	16
O <sub>3</sub>	4	3	6	2	5
<b>Demand</b>	6	10	15	4	35

**DSE54L:E2L  
COMBINATORIAL OPTIMIZATION LAB**

**Program : 10  
Viva : 05  
Practical Copy :05  
Total : 20**

**Answer any *one* question on lottery basis**

1. Write a program to implement branch and bound algorithm.

2. Write a program to find a solution for travelling salesman problem.

3. Write a program to implement dual simplex algorithm.

4. Write a program to implement cutting plane algorithms.



**DSE54L:E3L**  
**NUMERICAL METHODS LAB**

<b>Program</b>	<b>: 10</b>
<b>Viva</b>	<b>: 05</b>
<b>Practical Copy</b>	<b>:05</b>
<b>Total</b>	<b>: 20</b>

**Answer any *one* question on lottery basis using C/C<sup>++</sup>**

1. Find the roots of the equation by bisection method.

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2. Find the roots of the equation by Newton-Raphson method.

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3. Solve the boundary value problem using finite difference method.

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4. Find Curve Fitting By Least-Square Approximations.

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5. Solve The System Of Linear Equations Using Gauss-Elimination Method.

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6. Solve The System Of Linear Equations Using Gauss-Seidel Iteration Method.

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7. Find the roots of an equation using Regula-Falsi method.

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8. Find the eigenvalue and eigenvector of a matrix by iterative method.

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9. Find inverse of a matrix using Gauss-Jordan Method.

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10. Find numerical integration using Trapezoidal Rule.

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