National University of Computer and Emerging Sciences

Lahore Campus

Operations Research (MT 4031)	
Date: 5-11-2024	
Course Instructor(s)	
Dr. Misbah Irshad, Dr. Uzma Bashir, Mr. Yasir	

Sessional-II Exam	
Total Time (Hrs.):	1
Total Marks:	30
Total Questions:	3

2505 Roll No

SE-5A Section

Student Signature

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Attempt all the questions.

CLO #: 1 Recognize the importance of operations research and linear programming by learning the characteristics of different types of decision-making environments, appropriate decision-making approaches, and tools to be used in each type.

Q1: [8+7]

a. Solve the following linear model without using artificial variables.

$$\text{Max } z = -5x_1 - 25x_2 - 20x_3$$

subject to

$$-x_1 + x_2 + x_3 \geq 2$$
$$x_1 - 3x_2 \geq 3$$
$$x_1, x_2, x_3 \geq 0.$$

b. Use simplex method to solve the dual of the given primal LP and comment about the solution of the primal problem without solving it.

$$\text{Min } z = x_1 + x_2$$

subject to

$$x_1 \geq 6$$
$$x_2 \geq 6$$
$$x_1 + x_2 \leq 11$$
$$x_1, x_2 \geq 0.$$

CLO #: 2 Solve the Transportation Models and Assignment Models.

Q2: [8]

Find an initial basic solution of the following transportation problem using three different methods and compare the associated transportation cost.

5	1	8	12
2	4	0	14
3	6	7	4
9	10	11	

CLO #: 2

Q3: [7]

Find the shortest route between the home/source (node a) and destination (node e) in the given transportation network problem.