MIG

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**Unit 5 Prerequisite 1** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Integer Programming

1. Objective Function: Constraints:

0.5x + y = P 3x + 4y ≤ 18

x ≤ 5

Optimal Solution: Maximum Profit:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. Objective Function: Constraints:

2x + y = C 5x + y ≥ 9

2x + 2y ≥ 5

Optimal Solution: Minimum Cost:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3. Objective Function: Constraints:

12x + 2.75y = C 2x + 7y ≥ 18

3x + y ≥ 15

x + y < 10

Optimal Solution: Minimum Cost:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4. Objective Function: Constraints:

6.25x + 4.3y = C 8x + 2y < 203

x ≥ 12.75

9x + 12y > 62

Optimal Solution: Maximum Cost:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. An artist is making mugs and plates to sell. It takes her 10 minutes to make a mug and 5.5 minutes to make a plate. Each mug uses ¾ lb of clay and each plate uses 1 lb of clay. She has 8 lbs of clay available to use during the 90 minute class. She also must make at least 2 plates for her to display. If she sells the mugs for $7 and the plates for $5.75, how many of each should she make in order to maximize her profit?

Decision Variables: Constraints:

Objective Function:

Optimal Solution: Maximum Profit:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. A company makes two types of book bags, B1 and B2. To make the book bags involves both stitching by hand and stitching by machine. B1 takes 40 minutes of hand stitching and 49.5 minutes of machine stitching while B2 takes 45 minutes of hand stitching and 23 minutes of machine stitching. Preordered sales of the newer B1 have already reached 100 but they only have 150 hours of hand stitching and 90 hours of machine stitching available. If the newer B1 costs $25.50 to produce and B2 costs $17.73 to produce, how many can they make of each while minimizing their costs?

Decision Variables: Constraints:

Objective Function:

Optimal Solution: Minimum Cost:

Sentence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Integers do not include what types of numbers? \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. When using Integer Programming, which cannot contain decimals?

*Circle one* THE OPTIMAL SOLUTION or THE MAXIMUM/MINIMUM