5. In the transportation problem on the next page, products are produced at plants in Locations A and B and shipped to warehouses in locations X, Y and Z.

5a. According to the model formulation, what is the capacity of Plant B? \_\_\_\_\_\_\_\_\_

5b. According to the model formulation, what is the demand at warehouse Z? \_\_\_\_\_\_\_\_\_\_\_

5c. According to the model formulation, what is the shipping cost for sending products from Plant A to Plant B?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5d. According to the solution, how many products should be shipped from Plant A to Plant B?

\_\_\_\_\_\_\_\_\_\_

5e. At what point would more products would be shipped from Plant A to Warehouse Y?\_\_\_\_\_\_

5f. What would be the total shipping cost if the demand at warehouse Z was equal to 600?\_\_\_\_\_

6g. At what point would less products would be shipped from Plant B to warehouse Z?\_\_\_\_\_\_

7h. What would be the total shipping cost if the capacity of Plant B was equal to 700? \_\_\_\_\_\_\_\_

7i. At what point would some units be shipped from Plant A to warehouse X? \_\_\_\_\_\_\_\_\_\_\_\_

7j. Would the current solution remain optimal if the shipping cost from Plant A was $9, $8.75 and $14 to warehouses X, Y, and Z, respectively? Demonstrate.

MIN 11AX+8AY+12AZ+1.5AB+6BX+8BY+5BZ+1YZ

S.T.

1) 1AX+1AY+1AZ+1AB<1200

2) -1AB+1BX+1BY+1BZ<600

3) 1AX+1BX>500

4) 1AY+1BY-1YZ>600

5) 1AZ+1BZ+1YZ>700

OPTIMAL SOLUTION

Objective Function Value = 12200.000

Variable Value Reduced Costs

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AX 0.000 3.500

AY 600.000 0.000

AZ 0.000 5.500

AB 600.000 0.000

BX 500.000 0.000

BY 0.000 1.500

BZ 700.000 0.000

YZ 0.000 2.500

Constraint Slack/Surplus Dual Prices

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1 0.000 0.000

2 0.000 1.500

3 0.000 -7.500

4 0.000 -8.000

5 0.000 -6.500

OBJECTIVE COEFFICIENT RANGES

Variable Lower Limit Current Value Upper Limit

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AX 7.500 11.000 No Upper Limit

AY 5.500 8.000 9.500

AZ 6.500 12.000 No Upper Limit

AB 0.000 1.500 4.000

BX 1.500 6.000 9.500

BY 6.500 8.000 No Upper Limit

BZ 1.500 5.000 7.500

YZ 1.500 1.000 No Upper Limit

RIGHT HAND SIDE RANGES

Constraint Lower Limit Current Value Upper Limit

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1 1200.000 1200.000 No Upper Limit

2 600.000 600.000 1200.000

3 0.000 500.000 500.000

4 0.000 600.000 600.000

5 100.000 700.000 700.000