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