

## 2. Connellsville Coal Company (15 points)

Suppose that CCC Inc. (Connellsville Coal Company) sells three types of coal: Type A, Type B, and Type C. Type A coal comes directly from one of its mines and so does Type C. The weekly mining capacity for Type A coal is 1000 tons and for Type C it is 1500 tons. Type B, however, is not mined. Rather it is produced by simply blending Type A and Type C coal.

Type A and Type C coal have the following characteristics:

Type	Coal dust (in lbs per ton)	Steam produced (in lbs per ton)	Mining Cost (\$ per ton)
A	3	24,000	\$10
C	7	36,000	\$15

The blended Type B coal is guaranteed to have no more than 4 lbs of coal dust per ton and no less than 25,000 lbs of steam produced per ton. The company can sell as much of Type A, B and C coal that it can produce. Excluding the cost of coal, based on current prices the contributions to profit for next week are \$50 per ton for Type A, \$40 per ton for Type B, and \$35 per ton for Type C.

The company has a commitment to sell at least 500 tons of Type B coal. Also, because of market constraints it can sell no more than 1000 tons of Type A.

- Formulate the problem as an algebraic linear optimization model. Be sure to define your variables. (Handwrite answer. 5 points)
- Construct an EXCEL model for this problem.  
(Hand in your formula sheet. 5 points)
- Optimize your EXCEL model using Solver and give the Answer and Sensitivity Reports. From the Answer Report, what is the optimal solution and the optimal value of the objective? (Handwrite answer. 5 points)