Applichem (A) (HBS 9-685-051)

Consider the following questions when analyzing the case. Along with your answers to these questions, please make sure to submit the excel file with all your calculations and analyses. Please go as deep as possible and provide justifications and explanations from different angles.

1. Compare the performance of Applichem's six release-ease plants? How would you rate their performance? What factors must be considered when evaluating performance? Please justify your answer using different analyses and arguments.

2. You are provided a workbook APPLICHEM.XLS (see course website) to help you evaluate production and distribution decisions. **All costs are in 1000's of US$**. The data is from Exhibits 2, 4, 5, and 6 of the case and is as follows:

    a. **Variable cost per 100,000 lb.**: Calculated from Exhibit 2 using raw materials, direct labor, waste treatment and supplies as the components. The costs are in 1000's of $ per 100,000 lb.
    b. **Fixed cost**: Remaining costs are treated as fixed costs and the fixed cost per plant is obtained by multiplying the remaining costs by the volume produced in 1982. The costs are in 1000's of $.
    c. **Transportation costs**: Obtained from Exhibit 5. The costs are in 1000's of $ per 100,000 lb.
    d. **Import duties**: Obtained from exhibit 5. The worksheet assumes that duties are charged based on the production cost in the source country. Thus, the duties for entry into Mexico would differ if the source plant is Frankfurt or Gary.
    e. **Demand**: The demands assumed by region are
        i. Mexico 3.0 million pounds
        ii. Canada 2.6 million pounds
        iii. Latin America 16.0 million pounds
        iv. Europe 20.0 million pounds
        v. Asia Pacific 11.9 million pounds
        vi. U.S.A 26.4 million pounds
    f. **Exchange rates**: Obtained from Exhibit 6.
    g. **Price Indices**: Obtained from Exhibit 6.

3. All input data is contained in the worksheet "APPLICHE". All cost calculations are based on the costs given in 1982 US$. The basic assumption is that the technology at the plants has not changed significantly in the specified six years. To evaluate variable and fixed costs for a given year (between 1977 and 1982), enter the year in cell "C3" (say 1981) and simply click on the button "Calculate Costs" in the worksheet "APPLICHE". All calculations are done automatically and the costs in 1981 US$ are obtained. The variable and fixed costs are calculated and appear on "Sheet1" along with the demand by region. The adjustments to cost are as follows:

$$COST^{1982}_{19XX} = COST_{1982} * \left(\frac{EXCHANGRT_{1982}}{EXCHANGRT_{19XX}}\right) * \left(\frac{PRICEINDEX_{19XX}}{PRICEINDEX_{1982}}\right)$$

For example, the raw material cost in Mexico in 1982 was $75.05 per hundred pounds of release-ease. This translates to 5.05*96.5 Pesos in 1982, which is equivalent to 75.05*96.5*(124.4/194.2) 1981 Pesos. This is equivalent to 75.05*(96.5/26.2)*(124.4/194.2) = 177.07 1981 US$. For this calculation to be truly valid, we are making the assumption that all raw materials are procured locally for production.

4. The costs obtained in step 3 can be used as input to any optimization models that you learnt in your Optimization course. For example, see “Sheet 2” and “Sheet 3”.

5. How do you think Joe Spadaro should structure his worldwide manufacturing system? Assume that the past is a reasonable indicator of the future in terms of exchange rates and inflation. How would you justify your answer? Please justify using different analyses and arguments.

6. What impact do you think the abolition of all duties will have on your recommendations?