HOMEWORK #3

COMMENTS & SOLUTION SET

General Comments:

For each problem you must provide a clear set of decision variables, an objective function w/proper coefficients that Maximizes or Minimizes, a full set of constraints with the proper coefficients & parameter limit (right hand side stuff), & finally a set of non-negativity assumptions.

NOTE: The video lecture on the course website entitled “LP Example Setup Video – EXCEL Portion” is the setup for problem #2

Specific Comments: See solution set below

1. The Waikiki Enterprise Corporation produces two types of computers. Profit on computer A is $900 while computer B is $600. The plant cannot produce more than 50 for computer A and 100 for computer B.

Decision variables are the variables used to make a decision.

Objective function is the formula used for calculating the best results.

Constraints are rules stated in the problem to then to be used in the formulas.

Non – negativity assumptions are using numbers to prove that the answer cannot be zero.

1. What are the decision variables?

The decision variables are the units for computer A and Computer B. Computer A = Xa. Computer B = Xb

1. What is the objective function?

Profit Maximization. 900 (Xa) + 900 (Xb)

1. What are the constraints?

Xa <= 50 (max x1)

Xb <= 100 (max x2)

51 (Xa) + 101 (Xb) <= 18000 (max capacity)

1. What are the non-negativity assumptions?

Xa and Xb are greater than or equal to 0

1. Firebridge’s tires come in two styles. The Fire Hawk uses 20 pounds of rubber and 6 pounds of steel. The Tiger Claw requires 15 pounds of rubber and 1 pound of steel. Available on hand is 3000 pounds of rubber and 300 pounds of steel. Firebridge must produce at least 20 Tiger Claws and at least 10 Fire Hawks. Of all tires provided twice as many must be Tiger Claws as Fire Hawks. Firebridge must provide 100 tires minimum. There is a $10 cost for Tiger Claws and Fire Hawks.

Decision variables are the variables used to make a decision.

Objective function is the formula used for calculating the best results.

Constraints are rules stated in the problem to then to be used in the formulas.

Non – negativity assumptions are using numbers to prove that the answer cannot be zero.

A. What are the decision variables?

The decision variables are the units for Firehawk and Tigerclaw. Firehawk is X1, TigerClaw is X2.

B. What is the objective function?

Minimizing costs of Z = 10 (X1) + 10 (X2)

C. What are the constraints?

X1>=10 (min x1)

X2>=20 (min x2)

X2 – 2 (X1) = 0 (2X Constraint)

X1 + X2 > 100 (total tires)

6(X1) + 1(X2) <= 300 (Steel)

20 (X1) + 15(X2) <= 3000 (Rubber)

D. Non – negativity assumptions

X1 and X2 greater than or equal to zero.