Assignment (2)

1. Formulate a linear programming model for the following problems:

a) A Village Butcher Shop traditionally makes the meat loaf from a combination of lean ground beef and ground mutton. The ground beef contains 80 percent meat and 20 percent fat, and costs the shop 80 cents per pound; the ground mutton contains 68 percent meat and 32 percent fat, and costs 60 cents per pound. How much of each kind of meat should the shop use in each pound of meat loaf if it wants to minimize its cost and to keep the fat content of the meat loaf to no more than 25 percent?

b) Weenies and Buns is a food processing plant, which manufactures sandwiches and bread. They grind their own flour for the bread at a maximum rate of 200 pounds per week. Each **bread** requires 0.1 pound of flour. They currently have a contract with Deli Inc., which specifies that a delivery of 800 pounds of chicken product is delivered every Monday. Each sandwich requires ¼ pound of chicken product. All the other ingredients in the sandwiches and breads are in plentiful supply. Finally, the labor force at Weenies and Buns consists of 5 employees working full time (40 hours per week each). Each sandwich requires 3 minutes of labor, and each bread require 2 minutes of labor. Each sandwich yields a profit of $0.20, and each bun yields a profit of $0.10. Weenies and Buns would like to know how many sandwiches and how many breads they should produce each week to achieve the highest possible profit.

2. Solve the following LP problems graphically:

a) Maximize   Volume $= 8 X_1 + 12 X_2$

Subject to $10 X_1 + 20 X_2 \leq 140$

$6 X_1 + 8 X_2 \leq 72$

$X_1, X_2 \geq 0$

b) Minimize   Salaries $= 2500 X_1 + 3000 X_2$

Subject to $X_1 \geq 30$

$X_2 \geq 20$

$X_1 + X_2 \geq 60$

$X_1, X_2 \geq 0$

Deadline: Thursday 30/4/1436 H (19-2-2015)