***Problems for Graphical Method***

*Q1/ the Xecko Tool Company is considering bidding on a job for two airplane wing parts. Each wing part must be processed through three manufacturing stages stamping, drilling, and finishing for which the company has limited available hours. The linear programming model to determine how many of part and part the company should produce in order to maximize its profit is as follows:*



*A. Solve the model graphically. (Solution after solving graphically, x1 = 5.97, x2 = 10.82 & z= 13.722)*

*B. Indicate how much slack resource is available at the optimal solution point. (for stamping constraint( s1=0), for drilling constraint the (s2=0), for finishing constraint (s3=11.35 hours)*

*C. Determine the sensitivity ranges for the profit for wing part 1 and the stamping hours available. (485.33 ≤ c1 ≤ 1151.43)*

***2****. Beaver Creek Pottery Company is a small crafts operation run by a Native American tribal council. The company employs skilled artisans to produce clay bowls and mugs with authentic Native American designs and colors. The two primary resources used by the company are special pottery clay and skilled labor. Given these limited resources, the company desires to know how many bowls and mugs to produce each day in order to maximize profit. The two products have the following resource requirements for production and profit per item produced. There are 40 hours of labor and 120 pounds of clay available each day for production.*



1. *Formulate this Pb. as LPP & Solve the model graphically. (x1 = 24, x2 = 8 and z = 1360$)*
2. *Indicate how much slack resource is available at the optimal solution point.*
3. *Determine the sensitivity ranges for the profit for Mugs.*
4. *What if we changed the profit of a bowl (x1), from $40 to $100? How would that affect the solution identified?*

*3. A farmer is preparing to plant a crop in the spring and needs to fertilize a field. There are two brands of fertilizer to choose from, Super-gro and Crop-quick. Each brand yields a specific amount of nitrogen and phosphate per bag, as follows:*



*The farmer’s field requires at least 16 pounds of nitrogen and at least 24 pounds of phosphate. Super-gro costs $6 per bag, and Crop-quick costs $3. The farmer wants to know how many bags of each brand to purchase in order to minimize the total cost of fertilizing. (x1 = 0) (x2 = 8) (z = 24)*