

$x_1$  - Large Refrigerator  
 $x_2$  - small Refrigerator.

$P$  - Time Available in compressor shop / Body shop

Time to produce 1 Large compressor =  $\frac{P}{1200}$

Time to produce 1 small compressor =  $\frac{P}{3000}$

if we make  $x_1$  Large,  $x_2$  small compressors,

$$\text{time needed} = \frac{Px_1}{1200} + \frac{Px_2}{3000}$$

$$\Rightarrow \frac{Px_1}{1200} + \frac{Px_2}{3000} \leq P$$

$$\frac{x_1}{1200} + \frac{x_2}{3000} \leq 1 \Rightarrow 5x_1 + 2x_2 \leq 6000$$

similarly, constraint on body :

$$\frac{Px_1}{1500} + \frac{Px_2}{2500} \leq P \Rightarrow 5x_1 + 3x_2 \leq 7500$$

$$x_1 \geq 2000 \quad (\text{Monthly demand constraints})$$

$$x_2 \geq 1000$$

LPP:

$$\text{Max } Z = 1500x_1 + 1000x_2 - 1500000$$

S.T

$$5x_1 + 2x_2 \leq 6000$$

$$5x_1 + 3x_2 \leq 7500$$

$$x_1 \geq 2000$$

$$x_2 \geq 1000$$

$$x_1, x_2 \geq 0$$