Solution: Test N°05

To convert this problem which is not in its canonical form we have to convert it in its canonical form then we convert it to dual form as follows;

Canonical form :

$$\text{Maximize: } Z=2x1 \quad +3x2 \quad +5x3$$

Subject to;

$$\begin{cases} x1+2x2+3x3 \leq 10 & \text{(Constraint 1)} \\ -2x1+x2-x3 \leq -8 & \text{(Constraint 2)} \\ x1+x2-x3 \leq 5 & \text{(Constraint 3)} \\ x1-3x2-2x3 \leq -12 & \text{(Constraint 4)} \\ x1 \geq 0,\ x2 \geq 0,\ x3 \geq 0 \end{cases}$$

Dual problem :

$$\text{Minimize: } W=10y_1+8y_2+5y_3+12y_4$$

Subject to:

$$\begin{cases} y_1-2y_2+2y_3+y_4 \geq 2 \\ 2y_1+y_2+y-3y_4 \geq 3 \\ 3y_1-1y_2-1y_3-2y_4 \geq 5 \\ y_1 \geq 0,\ y_2 \geq 0,\ y_3 \geq 0,\ y_4 \geq 0 \end{cases}$$