## 620-261 Introduction to Operations Research

# ASSIGNMENT 5

*Post in boxes by 3.00 pm on Monday 21st April 2008*

1. Solve the following linear program using the two-phase method.

   $$\text{Maximise} \quad z = 2x_1 + 4x_2 - x_3$$

   subject to

   $$\begin{aligned} 2x_1 + 4x_2 - 2x_3 &\leq 20 \\ 2x_1 - x_2 + 3x_3 &\geq 10 \\ 4x_1 + 3x_2 + x_3 &\leq 30 \end{aligned}$$

   with $x_1$, $x_2$ and $x_3$ non-negative.

2. Write down the $3 \times 3$ elementary matrices $E_1, E_2, \ldots, E_n$ corresponding to each of the row operations that you performed on the constraint coefficient matrix $S$ and the right hand column $b$ in question (1).

3. Verify that the final tableau $[S'|b']$ can be written in the form $[TS|Tb]$ where $T = E_n E_{n-1} \ldots E_1$.