

SOLUTIONS PRACTICE EXAM II

pg 1ne

①

THERE ARE 4 slack VARIABLES

x_1	x_2	s_1	s_2	s_3	s_4	P	k
0	1	4	0	4	0	0	45
0	0	-3	0	4	0	0	80
0	0	5	0	7	1	0	60
0	0	-10	-1	7	0	0	75
0	0	3	0	2	0	1	900

MAXIMIZE:

MAX PROFIT

$$x_1 = 30$$

$$P = 900$$

$$x_2 = 45$$

②

2 slack VARIABLES

x_1	x_2	x_3	x_4	x_5	s_1	s_2	P	k
7	0	3	-4	1	11	6	0	42
4	1	8	5	0	5	2	0	55
3	0	2	1	0	3	1	1	940

MAXIMIZE

$$x_1 = 0$$

$$x_4 = 0$$

$$x_2 = 55$$

$$x_5 = 42$$

$$x_3 = 0$$

$$P = 940$$

③

2 slack Variables

x_1	x_2	x_3	s_1	s_2	P	k
0	1	1	-2	16	0	0
1	10	0	11	8	0	3
0	0	0	6	11	1	17

MAXIMIZE

$$x_1 = 3$$

$$x_3 = 8$$

$$x_2 = 0$$

$$P = 17$$

④

3 slack Variables

y_1	y_2	y_3	s_1	s_2	s_3	z	k
9	0	0	1	7	3	0	20
9	0	1	0	8	-5	0	44
7	1	0	0	2	12	0	37
5	0	0	0	11	10	1	116

MINIMIZE

$$x_1 = 0$$

$$C = 116$$

$$x_2 = 11$$

$$x_3 = 10$$

⑤

2 slack Variables

y_1	y_2	y_3	s_1	s_2	z	k
1	0	4	17	3	0	48
0	1	7	5	-1	0	36
0	0	2	22	9	1	1140

MINIMIZE:

$$x_1 = 22$$

$$C = 1140$$

$$x_2 = 9$$

(6)

4
slack
variables

s_1	s_2	s_1	s_2	s_3	s_4	z	k
0	1	4	0	4	0	0	45
1	0	-3	0	4	0	0	30
0	0	5	0	7	1	0	60
0	0	10	1	7	0	0	75
0	0	3	0	2	0	1	900

MINIMIZE:

$x_1 = 3$ $x_4 = 0$
 $x_2 = 0$ $C = 900$
 $x_3 = 2$

(II)
(7)

1	0	9	0	4	0	0	45
0	1	-10	0	4	0	0	30
0	0	5	0	7	1	0	60
0	0	10	1	7	0	0	75
0	0	-3	0	-2	0	1	900

most
negative

NOTE: I WILL
ASK FOR THIS

RATIOS

Least
positive

$45/9 = 5$
 $30/10 = -3$
 $60/5 = 12$
 $75/10 = 7.5$

SO: Row # 1
 Column # 3
 Reciprocal $1/9$

(8)

30	20	10	5	1	0	0	60
10	10	30	15	0	1	0	90
-45	-20	-33	-52	0	0	1	0

MOST
NEGATIVE

$60/5 = 12$ Least
positive

$90/15 = 6$

SO Row # 2
 Column # 4
 Reciprocal $1/15$

⑨

$$\left[\begin{array}{cccccc|c} 0 & 9/2 & 10 & 1 & 0 & 0 & 5/2 \\ 1 & 7 & 1/8 & 0 & 0 & 0 & 7/4 \\ 0 & 11/4 & 7/2 & 0 & 1 & 0 & 1/2 \\ 0 & -2 & -4 & 0 & 0 & 1 & 35/2 \end{array} \right]$$

$\frac{5/2}{10} = \frac{5}{2} \cdot \frac{1}{10} = \frac{1}{4}$
 $\frac{7/4}{1/8} = \frac{7}{4} \cdot \frac{8}{1} = 14$
 $\frac{1/2}{7/2} = \frac{1}{2} \cdot \frac{2}{7} = \frac{1}{7}$

MOST NEGATIVE →
 LEAST POSITIVE →

Row # 3
 Column # 3
 RECIPROCAL = $2/7$

⑩ PRE-INITIAL MATRIX: TRANSPOSE

$$\left[\begin{array}{ccc|c} 5 & 4 & 1 & 40 \\ 2 & 1 & 11 & 24 \\ 1 & 2 & 4 & 12 \\ 10 & 17 & 12 & 0 \end{array} \right] \rightarrow \left[\begin{array}{ccc|c} 5 & 2 & 1 & 10 \\ 4 & 1 & 2 & 17 \\ 1 & 11 & 4 & 12 \\ 40 & 24 & 12 & 0 \end{array} \right]$$

} 3 slack variables

$$\Rightarrow \left[\begin{array}{cccccc|c} 5 & 2 & 1 & 1 & 0 & 0 & 10 \\ 4 & 1 & 2 & 0 & 1 & 0 & 17 \\ 1 & 11 & 4 & 0 & 0 & 1 & 12 \\ -40 & -24 & -12 & 0 & 0 & 0 & 0 \end{array} \right]$$

⑪ There are 4 slack variables

$$\left[\begin{array}{cccccc|c} 5 & 4 & 1 & 0 & 0 & 0 & 8 \\ 2 & 1 & 0 & 1 & 0 & 0 & 4 \\ 1 & 2 & 0 & 0 & 1 & 0 & 12 \\ 2 & 6 & 0 & 0 & 0 & 1 & 20 \\ -20 & -40 & 0 & 0 & 0 & 0 & 0 \end{array} \right]$$

12) Find
 $X_1 = \# \text{POO-go}$

$X_2 = \# \text{rid-o-c"log"}$

$X_3 = \# \text{Whooah-away}$

The VARIABLES determine
the columns, so ~~the~~
every thing else (departments
and profit) are rows.

MAXIMIZE

$$\text{FAB : } 12X_1 + 15X_2 + 20X_3 \leq 1400$$

$$\text{ASSEM : } 3X_1 + 3X_2 + 6X_3 \leq 2000$$

$$\text{PACK : } 5X_2 + 6X_2 + 6X_3 \leq 1200$$

$$P = 5X_1 + 7X_2 + 10X_3$$

SO NOTE: THERE will BE 3 slack variables

$$\Rightarrow \left[\begin{array}{ccccccc|c} 12 & 15 & 20 & 1 & 0 & 0 & 0 & 1400 \\ 3 & 3 & 6 & 0 & 1 & 0 & 0 & 2000 \\ 5 & 6 & 6 & 0 & 0 & 1 & 0 & 1200 \\ -5 & -7 & -10 & 0 & 0 & 0 & 1 & 0 \end{array} \right]$$

~~sol~~

⊛ You MAY IGNORE #13

IT IS FLAWED

⊛ Remaining solutions will be posted
tomorrow (Friday)