Section A. Answer ALL questions

Q1. A company manufactures three products: X, Y and Z. Each product requires the use of time on machines A and B as given in the table below. The number of hours per week that A and B are available for production are 40 and 30, respectively. The profit per unit on X, Y and Z is SR 55, SR 66 and SR80, respectively. At least five units of Z must be produced next week. Formulate the LPP that maximizes the profit for the company. First complete the table below. **DO NOT SOLVE THE LPP**.

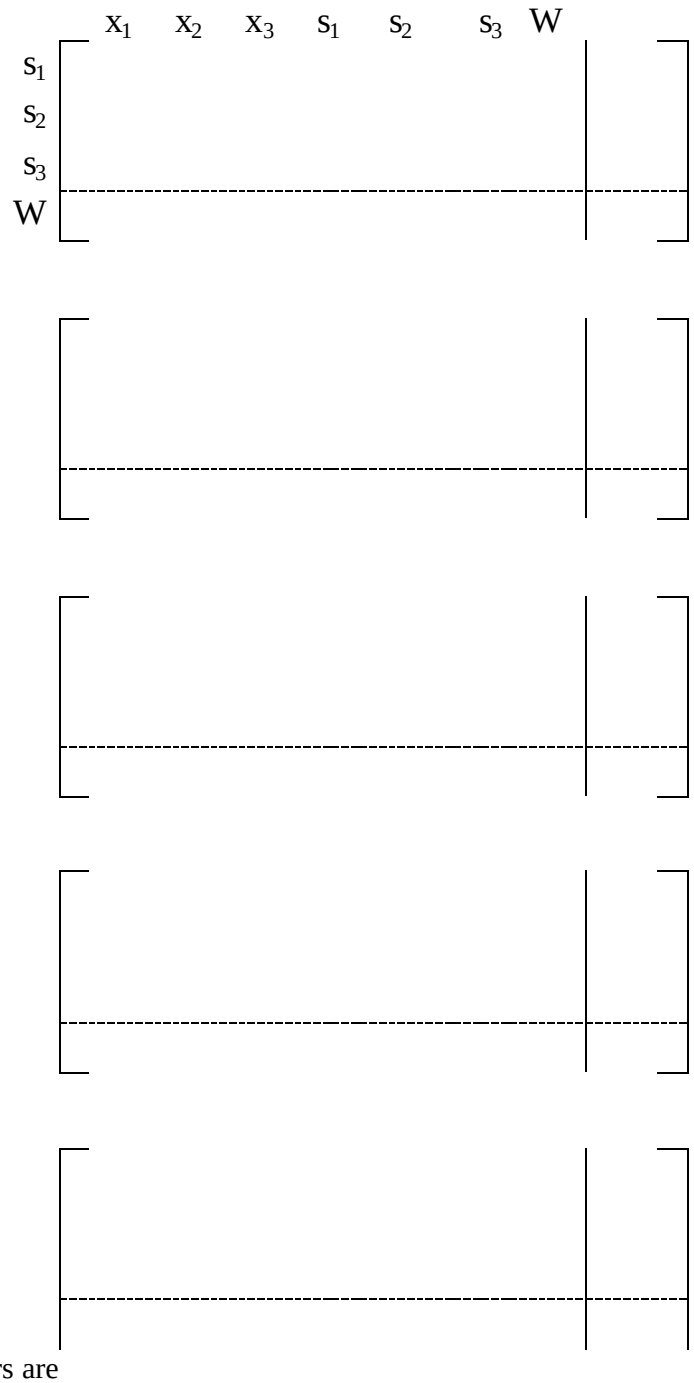
	Time/hrs			
	Machine A	Machine B	Profit/SR	Quantity
Product X	1	1		
Product Y	2	1		
Product Z	2	2		
Hours available				

[10 points]

Q2. Maximize: $W = 2x_1 + x_2 - 2x_3$, [20 points]

subject to

$$-2x_1 + x_2 + x_3 \geq -2$$
$$x_1 - x_2 + x_3 \leq 4$$
$$x_1 + x_2 + 2x_3 \leq 6$$
$$x_1, x_2, x_3 \geq 0.$$



Indicators are

Solution:

Var.	x_1	x_2	x_3	s_1	s_2	s_3	W
Value							

Q3 Find the **dual** of the following LPP: [10 points]

Minimize: $Z = 6x_1 + 15x_2 - 6x_3$,

subject to

$$x_1 + x_2 - x_3 \leq -3$$
$$-2x_1 - x_2 + 4x_3 \leq -8$$
$$x_1, x_2, x_3 \geq 0.$$

Section B. Answer any TWO questions

Q4. How long (to the nearest year) will it take money to triple at a nominal rate of 22.8% compounded every four months? [18 points]

Q5. If interest is compounded continuously, at what annual rate will a principal of SR 6174 quadruple (i. e. four-fold or four times) in 25 years?. Give your answer to the nearest percent. [18 points]

Q6. A debt of SR 8000 due in two years and SR 6000 due in six years are to be repaid by a single payment of SR 2000 now and another payment three years from now. If the interest rate is 8% compounded quarterly, how much is the payment that is due three years from now? [18 points]

Section C. Answer ONLY ONE question

Q7. Find the present value of SR 1800 paid at the beginning of each six-month period for 6 years at the rate of 4% compounded semiannually. [24 points]

Q8. Suppose SR 1000 is placed in a savings account at the end of each month for two and a half years. If no further deposits are made, (i) how much is in the account after two and a half years? (ii) how much of this amount is compound interest? Assume that the savings account pays 6% compounded monthly. [24 points]

WORK SHEET. PLEASE DO NOT REMOVE!