

# 大同大學 89 學年度研究所招生入學考試試題

考試科目 管理科學

所別 資訊經營研究所 第 1 / 頁

註：本次考試  不可 參考自己的書籍及筆記  不可 查字典  不可 使用計算器

- The Mother's Pride Bakery makes coffee cakes and Danishes in large pans. The main ingredients are flour and sugar. There are 25 pounds of flour and 16 pounds of sugar available and the demand for coffee cakes is 5. Five pounds of flour and 2 pounds of sugar are required to make a pan of coffee cake, and 5 pounds of flour and 4 pounds of sugar are required to make a pan of Danishes. A pan of coffee cakes has a profit of \$2, and a pan of Danishes has a profit of \$5. Determine the number of pans of coffee cakes and Danishes to produce each day so that profit will be maximized. (20%)
  - Formulate a linear programming model for this problem.
  - Solve this model using graphical analysis.

- Solve the following linear problem using simplex method (20%)

$$\text{Minimize } z = 50x_1 + 20x_2 + 30x_3 + 80x_4$$

$$400x_1 + 200x_2 + 150x_3 + 500x_4 \geq 500$$

$$3x_1 + 2x_2 \geq 6$$

$$\text{subject to } 2x_1 + 2x_2 + 4x_3 + 4x_4 \geq 10$$

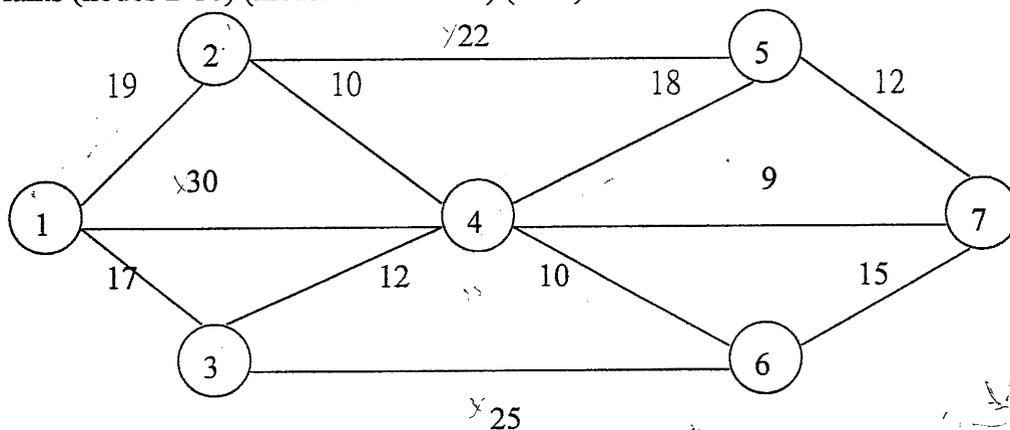
$$2x_1 + 4x_2 + x_3 + 5x_4 \geq 8$$

$$x_1, x_2, x_3, x_4 \geq 0$$

- Find optimum for the following transportation problem. (20%)

From	To			supply
	1	2	3	
A	\$6	9	7	130
B	12	3	5	70
C	4	8	11	100
Demand	80	110	60	

- Determine the shortest conveyor route from the distribution/inventory at node 1 to each of the other plants (nodes 2-10) (measure in meters) (20%)



- Solve the following non-linear problem (20%)

$$\text{Maximize } z = 30x_1 - 2x_1^2 + 25x_2 - 0.5x_2^2$$

$$\text{subject to } 3x_1 + 6x_2 = 300$$

$$x_1, x_2 \geq 0$$

$17+12+10+15+12+22$

$300 - 6x_2 = 300$