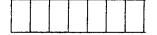
國立臺北科技大學

九十四學年度工業工程與管理系碩士班入學考試

作業研究試題

填准考證號碼

第一頁 共二頁



- 本試題共五題,配分共100分。
 請按順序標明題號作答,不必抄題。
- 全部答案均須答在答案卷之答案欄內,否則不予計分。
- Which of the following questions are TRUE or FALSE? Why? (5 points each)
- (1) Min Z=max { $|2X_1 + 3X_2|$, $|X_1 X_2|$ } Subject to $X_1, X_2 \ge 0$

is a LP model.

- (2) When the optimal solution of a LP model is overdetermined, it means at least on of the constraints is redundant and vice versa.
- (3) The system BX=b has infinity of solutions if B is singular, and b is dependent relative to the vectors of **B**.
- (4) The iteration of a LP model is given by the following tableau

Basic	X_1	X_2	X_3	X_4	Solution
Z	-2	-1	0	0	0
X ₃	1	-1	1	0	10
X_4	2	0	0	1	40

We can say it is redundant.

Max
$$Z = 6X_1 + 3X_2$$

Subject to

$$X_1 + X_2 \ge 10$$

 $2X_1 + 3X_2 \le 12$
 $X_1, X_2 \ge 0$

- (2) Have you met any problem in calculation? What is the reason? (5 points)
- (3) What are the advantages and disadvantages of the dual simplex method. (5 points)
- ≡ Consider the following Linear programming problem:

Max
$$Z = 5X_1 + 6X_2 + 4X_3$$

Subject to
$$3X_1 + 4X_2 + 2X_3 \le 120$$
$$X_1 + 2X_2 + 3X_3 \ge 30$$
$$X_1 + 2X_2 + X_3 \le 50$$
$$X_1, X_2, X_3 \ge 0$$

The optimal simplex Tableau is as follows:

Basis	C _B	X ₁	X ₂	X ₃	$\overline{S_1}$	S ₂	S ₃	Solution
		5	6		0	0	0	
S ₃	0	0	4	0	-2	7	1	80
X_3	4	0		1	-1	3	0	30
X_1	5	1	0	0	1	-2	0	20
\mathbf{Z}_{j}		5	8	4	1	2	0	220
$C_j - Z_j$		0	-2	0	-1	-2	0	

- (1) Find the values of two \square in the tableau. (10 points)
- (2) Compute the range of optimality of C_1 . (5 points)
- (3) Find the dual price for the third constraint. (5 points)

注意:背面尚有試題

Nine jobs are to be processed through four workers. Each worker can process any job, but at different efficiencies. A worker can not process more than one job at a time. The time requirements per job/man assignment and total times available for each worker are shown in the accompanying table. Determine the assignment that minimizes the total processing time. (20 points)

Job Worker	A	В	С	D
1	4	3	12	7
2	8	10	12	6
3	3	5	2	5
4	10	6	2	4
5	10	3	7	9
6	8	10	9	9
7	7	2	10	12
8	5	9	4	17
9	10	8	15	7 .
Available Time	15	12	20	14

$$\pi$$
 Let $A = \begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$

- (1) Find the rank of A. (5 points)
- (2) Find the eigenvalues of A.(5 points)
- (3) Find the eigenvectors of A. (5 points)
- (4) We understand $B^2 = A$, Find B. (5 points)