142-1

淡江大學96學年度碩士班招生考試試題

系別：運輸管理學系　　科目：作業研究

准帶項目請打「V」	
V	簡單型計算機

本試題共 2 頁

一. 概念題 (Basic Concept): 請回答 "真" (T) 或"偽" (F). **(10%)**

( ) 1. Simplex Method 中, maximization 或 minimization 問題所具備的 feasibility condition 是相同的.
(In the simplex method, the feasibility conditions for the maximization and minimization problems are the same.)

( ) 2. 藉由刪除多餘之限制式可避免退化解之出現.
(Degeneracy can be avoided if redundant constraints can be deleted.)

( ) 3. 在線性歸劃問題中若除去 nonbinding constraints 將不影響可行解空間.
(Deleting nonbinding constraints in LP will not affect solution space.)

( ) 4. 若在 optimal iteration 中顯示 artificial variable 為正值, 則此 LP 仍存有可行解.
(An LP may have a feasible solution even though an artificial variable appears at a positive level in the optimal iteration.)

( ) 5. 運輸問題一定可以表示為平衡模式.
(A transportation problem can always be represented by a balanced model.)

二. 計算題

1. Generalized Optimization Problem (15%)

Using Kuhn-Tucker condition to solve the problem and show that the solution is indeed a minimum.

Min $z(x_1, x_2) = 4(x_1 - 2)^2 + 3(x_2 - 4)^2$

s.t. $x_1 + x_2 \geq 5$
$x_1 \geq 1$
$x_2 \geq 2$

2. Integer Programming (15%)

Solve the following problems by the B&B method, given that the optimal solution for the **original LP** is: $Z = 7.31$, $X_1 = 1.69$, $X_2 = 1.13$.

Maximize $Z = 3X_1 + 2X_2$

subject to $2X_1 + 5X_2 + X_3 \leq 9$
$4X_1 + 2X_2 + 2X_3 \leq 9$

$X_1, X_2, \geq 0$ and integer

本試題雙面印製

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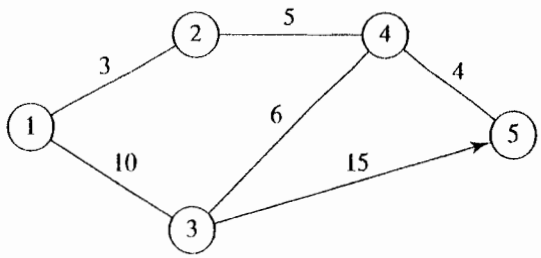
3. Shortest Path Problem (20%)

Given the network below:
(a) Use Floyd's algorithm to calculate shortest path between any two nodes
(b) Construct LP formulation to determine the shortest path between node 1 to node 5.



4. Primal–Dual Relationships (20%)

The following is the **optimal tableau** for a maximization LP problem with three (<) constraints and all nonnegative variables. The variables X_3, X_4, X_5 are the slacks associated with the three constraints. Determine the objective value in two different ways by using **(a) primal objective function** and **(b) dual objective function**.

Basic	X_1	X_2	X_3	X_4	X_5	Solution
Z	0	0	0	3	2	???
X_3	0	0	1	1	-1	2
X_2	0	1	0	1	0	6
X_1	1	0	0	-1	1	2

5. Dynamic Programming: Dynamic EOQ Inventory Problem (20%)

Suppose that the inventory holding cost is based on the ***average*** **inventory** during the period. Develop the corresponding **forward recursive equation of the Dynamic EOQ Inventory Problem for a single goods (單項商品)**. (Hint: Please draw a conceptual diagram to illustrate this problem.)