大葉大學九十二學年度　研究所碩士班　招生考試試題紙					
系所	組別	考試科目	考試日期	節次	備註
工業工程	甲	作業研究	4 月 13 日	第三節 13:30～15:00	共二頁 P2-1

註:不可攜帶計算機及其他參考資料

1. Howaii Sugar Company produces brown sugar, white sugar, powdered sugar and molasses from sugar cane syrup. The company purchases 2000 tons of syrup weekly and is contracted to deliver at least 20 tons weekly of each type of sugar. The production process starts by manufacturing brown sugar and molasses from the syrup. A ton of syrup produces 0.4 ton of brown sugar and 0.2 ton of molasses. Next, white sugar is produced by processing brown sugar. It takes one ton of brown sugar to produce 0.8 ton of white sugar. Finally, powdered sugar is produced from white sugar through a special grinding process that has a 85% conversion efficiency (one ton of white sugar produces 0.85 ton of powdered sugar). The profits per ton for brown sugar, white sugar, powdered sugar and molasses are $180, $210, $240 and $30. Please formulate the problem as a linear program so as to determine the weekly production schedule?(30%)

2. 已知有四項工作:1,2,3,4 將指派給四臺機器:A,B,C,D，各機器處理每項工作之加工時間(分鐘)如下表:

Machine\Job	1	2	3	4
A	10	12	14	20
B	15	26	21	16
C	12	17	14	18
D	19	113	15	17

請以匈牙利法求出最小總加工時間之指派結果(30%)?

3. Solve the following zero-sum game graphically. Let A_1, A_2 represent the mixed strategies of player A; B_1, B_2, B_3 represent the mixed strategies of player B. The pay-off matrix of player A is: (20%)

$$\begin{array}{c} \\ A_1 \\ A_2 \end{array} \begin{array}{c} \begin{array}{ccc} B_1 & B_2 & B_3 \end{array} \\ \begin{bmatrix} 1 & -3 & 7 \\ 2 & 4 & -6 \end{bmatrix} \end{array}$$

4. Solve the following problem from a dynamic programming (DP) perspective.

(20%)

$$
\begin{aligned}
Max \quad & z = y_1 y_2 \ldots y_n \\
st \quad & y_1 + y_2 + \ldots + y_n = c \\
& y_i \geq 0, \quad i = 1,2,\ldots,n.
\end{aligned}
$$