

大同大學 九十一 學年度 轉學考試 試題

考試科目：管理數學 系別：資訊經營學系 級別：三年級 第 2 頁，共 3 頁

註：本次考試不可以參考自己的書籍及筆記； 不可以使用字典； 不可以使用計算器。

3. Tatung University maintains a powerful mainframe computer for research use by its faculty. During all working hours, an operator must be available and maintain the computer, as well as to perform some programming services. John Lee, the director of the computer facility, oversees the operation. It is now the beginning of the spring semester, and John is confronted with the problem of assigning different working hours to his operators. Because all the operators are currently enrolled in the university, they are available to work only a limited number of hours each day, as shown in the following table.

Operators	Wage rate (in \$/per hour)	Maximum hours availability				
		Monday	Tuesday	Wednesday	Thursday	Friday
B.W.	10.10	6	0	6	0	8
N.C.	9.9	0	7	0	4	0
W.Z.	9.8	3	5	7	0	4
C.L.	10.90	3	0	3	8	0
G.K.	8.7	5	5	5	0	4
D.H.	11.0	0	0	0	5	3

There are six operators (four undergraduate students and two postgraduate students). They all have different wage rates because of differences in their experience with computers and in their programming skills. The above table shows their wage rates, along with the maximum number of hours that each can work each day. Each operator is guaranteed a certain minimum number of hours per week that will maintain an adequate knowledge of the operation. This level is set arbitrarily at 8 hours per week for the undergraduate students (B.W., N.C., W.Z. and D.H.) and 7 hours per week for postgraduate students (C.L. and G.K.). The computer facility is to be open for operation from 8 A.M. to 10 P.M. Monday through Friday with exactly one operator during these hours. On weekends, the computer facility is to be operated by other staff. Because of budget, John has to minimize costs. He needs to decide the number of hours he should assign to each operator on each day. Formulate this problem into a linear programming model. (25%)

(15)
5
8 ~ 10.
4

4. You need to take a trip by car to another town that you have never visited before. Therefore, you are studying a map shows the mileage along each road that directly connects two towns without any intervening towns. These numbers are summarized in the following table, where a dash indicates that there is no road directly connecting these two towns without going through any other towns. Formulate a network model for this problem and find the shortest path. (25%)

大同大學 九十一 學年度 轉學考試 試題

考試科目：管理數學 系別：資訊經營學系 級別：三年級 第 3 頁，共 3 頁
註：本次考試不可以參考自己的書籍及筆記； 不可以使用字典； 不可以使用計算器。

Miles Between Adjacent Towns

Town	A	B	C	D	E	Destination
Origin	40	20	50	—	45	—
A		25	—	70	—	—
B			20	55	20	—
C				—	60	—
D					10	-
E						50