

ISyE 3104 - Homework 13 – Part 2

Due: December 6, 2007

(15 points + 5 BONUS)

1. A machine shop of the company Vestel consists of three departments: A, B and C. The from-to-chart showing the distances in meters between department centers is as follows:

	A	B	C
A		6	9
B	8		16
C	6	12	

The shop carries out the production of four products: P1, P2, P3 and P4. The routing for the production of these products and monthly production rates are:

Product	Routing	Monthly production
P1	A-B-C	20
P2	A-C	40
P3	B-C	30
P4	B-A-C	10

Assume that products are produced (and handled) singly because they are large;

- a. (3 points) Convert this information into a from-to-chart giving the number of materials handling trips per month between departments.
- b. (2 points) If the cost to transport one product one meter is estimated to be \$1, convert the from-to-chart you found in part (a) to one giving the materials handling cost per month between departments.
- c. (2 points) Develop an activity relationship chart for these three departments based on the results you found in part (b). Use only the rankings H, M, L, where H corresponds to the costs higher than 400 and L to the costs lower than 100.

2. (4 points) Answer the following questions:

a) From the layout options of fixed position, product and process layouts indicate the one that best fits to the production of the corresponding product (Explain your answer):

Coke:

Special army products:

Airplane:

b) What are the benefits and drawbacks of group technology layout ?

3. (1 point) Centroids of 4 departments are A(2,8), B(10,18), C(6,6), D(4,4). What is the euclidean distance between departments A and D?

4. An initial layout of an area with 4 departments is give as follows

A	D	D
A	B	C
B	B	C

a. (3 points) find the centroid of each department. (Assume that each tile is a unit square.)

b. (5 points BONUS) If the activity relationship scores between departments are as follows:

1-2 : -10

1-3 : 6

1-4 : 2

2-3 : 1

2-4 : 4

3-4 : 0

Draw the activity relationship chart and determine a new layout that will improve the score which is defined as the sum of rectilinear distances between departments times the importance level (centroid evaluation). Also determine the new score.