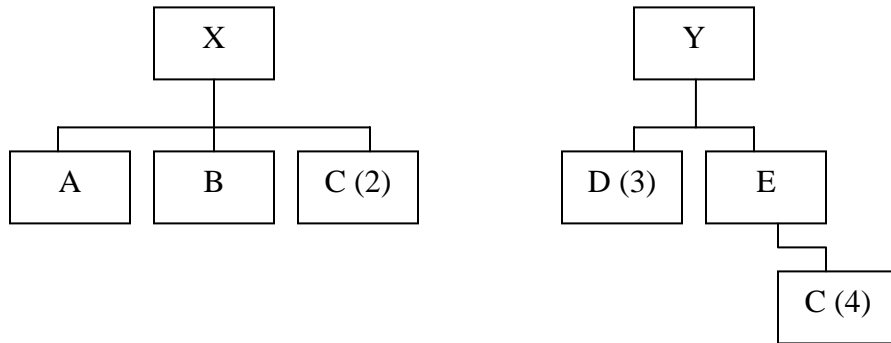


**ISyE 3104 - Homework 9**  
**Due: November 8, 2005**  
**(25 points)**

1. (5 points) Based on what we have seen in class, explain the relationship between service levels and inventory levels (e.g., what happens to the inventory levels if the company wants to achieve higher service levels?) Read the Snapshot Application at the end of Chapter 4 (Mervyn's recognized for state-of-the art inventory system). The book claims that the new inventory management system reduced inventories by an estimated \$60 million with no degradation of in-store service levels. While this sounds counterintuitive, explain how this statement might actually be true.

2. (10 points) The structures of the products X and Y of a company is of the following form:



In order to produce 1 unit of X, company needs 1 unit of A, 1 unit of B and 2 units of C. Similarly, to produce 1 unit of Y, they need to have 3 units of D and 1 unit of E, which consists of 4 units of C.

The demand forecast of these two products from period 4 to period 13 is given in the following table (We are at the beginning of week 1):

	4	5	6	7	8	9	10	11	12	13
X	85	95	120	100	100	50	180	120	100	80
Y	0	60	0	60	0	100	0	120	0	100

The inventory information for the following items is given:

	X	Y	C	A, B, D, E
On Hand (at the end of week 3)	25	20	120	0
On Order (sch. receipt for week)	175 (week 4)	0	0	100 (week 4)
Lot size	L4L	L4L	L4L	L4L
Lead Time	2	1	1	1

Tabulate the MRP process for the component C until the period 13. In what periods should the orders be released? What should be the size of those orders?

**3.** (10 points) Time-phased net requirements of a new product Z is given below from periods 1 to period 6:

	1	2	3	4	5	6
Z	335	200	140	440	300	200

Setup cost for each production run is \$200 and the holding cost per period is \$0.30 for each unit of Z.

Find the lot sizes for the following rules:

- a. With EOQ formula
- b. Using Silver-Meal Heuristic
- c. Using Least Unit Cost (LUC) Heuristic
- d. Using Part Period Balancing (PPB)
- e. Calculate and compare the holding and setup costs of the methods used in parts (a) to (d) and the lot-for-lot method. Which method is the best option in terms of cost?