NORTHEASTERN UNIVERSITY

Department of Mechanical and Industrial Engineering

Supply Chain Engineering **Prof. Gupta**

IE 7200 **Spring 2014 (Mondays)**

Homework No. 3

(Due: February 10, 2014)

Problem 1. An item is manufactured in batches within a manufacturing facility and the following data is applicable:

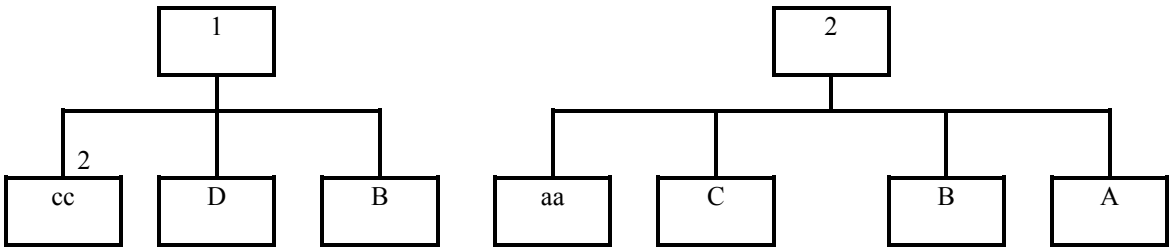
Consumption rate:	500 items/ month
Production rate:	1500 items/ month
Storage costs (based on average inventory):	$10 per unit-year
Interest charges:	$5 per unit-year
Setup charges per batch:	$200

The batch is produced so that it is completed exactly when the previous batch is depleted. Determine the EMQ value and associated inventory costs per unit.

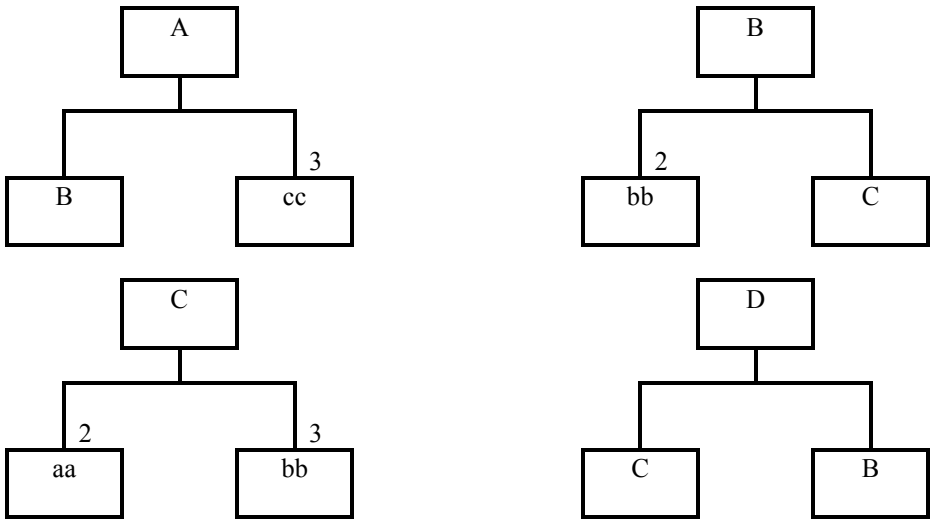
Problem 2. For the item given in the previous problem, assume that the batch is to be completed 0.2 month before the previous batch is depleted. Determine the EMQ value and the associated inventory costs per unit.

Problem 3. A company manufactures two products, which are broken down as follows:

End Products:



Subassemblies:



Draw the two product-structure trees using low-level coding.

Problem 4. Given the following data, develop the gross and net requirements report for a 6-week period using the tree structure in the previous problem. Assume set up cost to be $25/order and the carrying cost to be $0.10/unit/week.

Item	1	2	A	B	C	D	aa	bb	cc
Demand in week									
1	40	20							
2	20	10							
3	10	30							
4	60	50		10					
5	10	70					20		
6	30	40			10				
On-hand Inventory	80	40	30	100	100	100	200	300	500
Lead Time	1	1	1	1	1	1	1	1	1
Lot sizing rule	EOQ	POQ	PPB	LFL	LFL	LFL	LFL	LFL	LFL