

Homework #9

Supply Chain Models: Manufacturing & Warehousing (ISyE 3104) - Fall 2001 Due November 8, 2001

Show all your steps to get credit.

Reading assignment: Read Chapter 7.

1. (55 points) The bill of materials for a finished product F1 is given below. The number in parentheses indicates the lead time (in weeks) for making or purchasing each item.

Item F1 (1): Composed of one unit of A1, A2 and A3, and 2 units of A4.

Item A1 (1): Composed of one unit of A2 and B1.

Item A2 (2): Composed of 1 unit of A4, B1 and B2

Item A3 (2): Composed of B1 and B2 and 3 units of B3

Item A4 (3): Composed of 2 units of B3

Item B1 (1): Composed of 1 unit of B3 and C1

Item B2 (3): Composed of 1 unit of C1 and C2

Item B3 (1): Composed of 1 unit of C1, C2 and C3

Items C1, C2 and C3 are purchased parts. Their lead times are 2, 2, and 4 weeks, respectively.

(a) (5 points) Draw the product structure.

(b) (5 points) What is the lead time for making item F1?

(c) (10 points) Forecasted demand for item F1 for the next quarter is given as follows:

Week	14	15	16	17	18	19	20	21	22	23	24	25
Demand	100	175	200	70	80	90	150	120	200	60	80	70

There will be 20 units in stock at the beginning of week 14, and the company expects 20, 50, 35 and 40 units to arrive in stock in weeks 15, 16, 17, and 18, respectively. Compute the time phased net requirements for item F1.

(d) (5 points) If the company expects 30 and 50 units of A4 to arrive in stock in weeks 13 and 14, compute the time phased net requirements for item A4.

(e) (30 points) The setup cost is \$200 and the holding cost is \$0.5 per item per week. Compute alternative planned order releases for item A4 using the following lot sizing rules: lot-for-lot, EOQ, Silver-Meal, part period balancing. Compute the total setup and holding cost of each alternative plan.

2. (10 points)

(a) Discuss why the EOQ formula may give poor results for determining planned order releases in MRP calculation.

(b) Discuss the advantages of having small lot sizes.