SCM 301

First Individual Assignment

Inventory Analysis

**SHORT ANSWER QUESTIONS:**

1. (12 points). Use the EOQ = $√\frac{2DS}{H}$ and ROP = $ dL+z\sqrt{Lσ\_{d}^{2}}+d^{2}σ\_{L}^{2}$ formulas to answer these.

 *(Hint: Look at each formula carefully and figure out what each variable really represents).*

1. How could you control the variables in the EOQ formula if you wanted to reduce EOQ inventory?
2. How could you control the variables in the ROP formula if you wanted to reduce ROP inventory?
3. For each formula, which variable do you think would be the easiest to change/manage? Why?
4. For each formula, which variable do you think you probably couldn’t change? Why?

2. (8 points). The JIT movement (having inventory show up just as it is needed for production) has long argued that firms should maximize their *process flexibility* so that:

1. Inventory ordering costs are minimal
2. Demand levels are stabilized
3. Lead times are as small as possible
4. Inventory holding costs are set artificially high

Using the EOQ and ROP formulas (see Question #3), explain how each of the efforts above (a. to d.) would be consistent with the JIT push for lower inventory levels. (Hint: Identify each variable above and see what impact it has on the above formulas – does it lead to lower inventory (a lower EOQ or ROP)?

**PROBLEMS:** *Remember showing work is important!*

3. (10 points). Joe runs a mail-order business for gym equipment. Annual demand for the TricoFlexers is 16,000 units. The annual holding cost per unit is $2.50, and the cost to place an order is $50.

1. What is the economic order quantity?
2. Suppose demand for TricoFlexers doubles to 32,000. What is the new EOQ? Does the EOQ also double?

4. (16 points). Computer City stocks and sells a particular brand of laptop. It costs the firm $625 each time it places an order with the manufacturer for the laptops. The cost of carrying one laptop in inventory for a year is $130. The store manager estimates that total annual demand for the laptops will be 1500 units, with a constant demand rate throughout the year. Orders are received within minutes after placement from a local warehouse maintained by the manufacturer. The store policy is never to have stockouts of the laptops. The store is open for business every day of the year except Christmas Day. Determine the following:

1. Optimal order quantity per order.
2. Minimum total annual holding and ordering costs.
3. The number of orders per year.
4. The time between orders (in working days).

5. (10 points). A manufacturing firm has been offered a particular component part it uses according to the following discount pricing schedule provided by the supplier:

 1 – 199 units $65 each

 200 – 599 units $59 each

 600+ units $56 each

The manufacturing company uses 700 of the components annually, the annual carrying cost is $14 per unit, and the ordering cost is $275. (Hint: See text pp. 341-343).

1. What is the optimal order size under EOQ?
2. What is the total cost using the basic EOQ model?
3. What is the total cost using the second-level quantity discount?
4. What is the total cost using the highest-level quantity discount?
5. Which amount should the firm order?

6. (12 points). Buy-More stocks color graphics monitors. The daily demand is normally distributed with a mean of 1.6 monitors and a standard deviation of 0.4 monitors. The lead time to receive an order from the manufacturer is a constant 15 days.

1. Determine the reorder point that will achieve a 98% service level. ( z value = 2.05).
2. What is the reorder point if the lead time is not consistent at 15 days, but has a standard deviation of 0.5 days?

7. (12 points). OfficeMax is considering using the Internet to order printers from Hewlett-Packard. The change is expected to make the cost of placing orders drop to almost nothing, although the lead time will remain the same. Using EOQ, ROP, and the TAC formulas, what happens to…

 *(Hint: Using the previous formulas plus the Total Cost (TAC) formula from p. 337).*

1. The order quantity?
2. The holding costs for the year?

c. The ordering costs for the year?