Lesson 17 Inventory Management Homework

Solved Problem #1: See textbook

Solved Problem #2: See textbook

Solved Problem #3: See textbook

#1: A large bakery buys flour in 25 pound bags. The bakery uses an average 4,860 bags a year. Preparing an order and receiving a shipment of flour involves a cost of $10 per order. Annual carrying costs are $75 per bag.

Answer the following questions.

a. Determine the economic order quantity.

b. What is the average number of bags on hand?

c. How many orders per year will there be?

d. Compute the cost of ordering flour, the cost of carrying the inventory, and the minimum total cost.

e. If ordering cost were increased by $1 per order, how much would that affect the minimum total annual cost?

#2: A large law firm uses an average of 40 boxes of copier paper a day. The firm operates 260 days per year. Storage and handling costs for the paper is $30 a year per box, and it costs approximately $60 to order and receive a shipment of paper.

Answer the following questions.

a. What order quantity would minimize the annual ordering and carrying costs?

b. What is the average number of boxes on hand?

c. How many orders per year will there be?
d. Compute the cost of ordering copier paper, the cost of carrying the inventory, and the minimum total cost.

e. How many days are there between orders?

f. The office manager is currently using an order size of 200 boxes. The partners of the firm expect the office to be managed in a cost-efficient manner. Would you recommend that the office manager use the optimal order size instead of the instead of 200 boxes? Why?

#3: A produce distributor uses 800 packing crates a month, which it purchases at a cost of $10 each. The manager has assigned an annual carrying cost of $35% of the purchase price per crate. Ordering costs are $28. Currently the manager orders once per month.

Answer the following questions.

a. What is the total cost of the current ordering method? This must be calculated manually.

b. What is the optimal cost? You can use the appropriate EOQ template to answer the remainder of the questions.

c. How much would be saved using the optimal EOQ cost?

d. Should the manager change his ordering method?

e. What is the optimal ordering quantity?
f. How many times will the manager order per year if he chooses to use the optimal ordering method?

#4: The Friendly Sausage Factory (FSF) can produce hot dogs at a rate of 5,000 per day. FSF supplies hot dogs to local restaurants at a steady rate of 250 per day. The cost to prepare the equipment for producing the hot dogs is $66. Annual holding costs are $.45 per hot dog. The factory operates 300 days per year.

Answer the following questions.

a. What is the annual demand for hot dogs?

b. What is the production run which will minimize total costs?

c. Based on the optimal production run in b., what is the maximum inventory?

d. What is the average inventory?

e. How many times will FSF have to make hot dogs every year?

f. When FSF starts a manufacturing run of hot dogs, how long will they run the machine (i.e. what is the run time)?

g. How long will it be from the end of a manufacturing run, until another run needs to be made (i.e. what is the pure consumption time – the difference between the order cycle time and the run time)?

#5: A chemical company produces sodium bisulfate in 100 pound bags. Demand for the product is 20 tons per day. The capacity for production is 50 tons per day. Setup cost is $100, and storage and handling costs are $5 per ton per year. The firm operates 200 days per year. (Note: 1 ton = 2,000 pounds)

Answer the following questions.

a. What is the annual demand in tons?
b. How many bags per manufacturing run are optimal?

c. What is the average inventory in bags for the optimal run size?

d. What is the manufacturing run time?

e. What is the pure consumption time?

#6: A mail-order house uses 18,000 boxes a year. Carrying costs are $.60 per box per year, and ordering costs are $96. The following price schedule applies.

<table>
<thead>
<tr>
<th>Number of Boxes</th>
<th>Price per Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 to 1,999</td>
<td>$1.25</td>
</tr>
<tr>
<td>2,000 to 4,999</td>
<td>$1.20</td>
</tr>
<tr>
<td>5,000 to 9,999</td>
<td>$1.15</td>
</tr>
<tr>
<td>10,000 or more</td>
<td>$1.10</td>
</tr>
</tbody>
</table>

Answer the following questions.

a. What is the optimal order quantity?

b. What is the common EOQ?

c. How many orders will the mail-order house have to make during the year?

d. What is the carrying cost, ordering cost, purchase cost and total cost for the optimal quantity?
A jewelry company buys semiprecious stones to make bracelets and rings. The supplier quotes a price of $5 per stone for quantities of 600 stones or more, $9 for orders of 400 to 599, and $10 per stone for lesser quantities. The jewelry firm operates 200 days per year. Usage is 25 stones per day, and ordering costs are $48.

a. If carrying costs are $2 per year for each stone, answer the following questions.
i. What is the optimal ordering quantity?

ii. What is the common EOQ?

iii. How many orders per year will the company make?

iv. What is the total ordering cost for the optimal solution?

b. If carrying costs are 30 percent of the purchase price per year for each stone, answer the following questions.
i. What is the carrying cost per unit when 400 to 599 stones are ordered?

ii. What is the optimal ordering quantity?

iii. What is the common EOQ?

iv. How many orders per year will the company make?

v. What is the total purchase cost for the optimal solution?

c. If the lead time is 6 working days, at what point should the company reorder?
#8: A company will begin stocking remote control devices. Expected monthly demand is 800 units. The devices can be purchased from two suppliers: A and B. The price lists for the two suppliers are shown below. Ordering cost is $40 and annual holding cost is 25% of unit price.

<table>
<thead>
<tr>
<th>Supplier A</th>
<th>Quantity</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 - 199</td>
<td>$14.00</td>
</tr>
<tr>
<td></td>
<td>200 - 499</td>
<td>13.80</td>
</tr>
<tr>
<td></td>
<td>500 +</td>
<td>13.60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier B</th>
<th>Quantity</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 - 149</td>
<td>$14.10</td>
</tr>
<tr>
<td></td>
<td>150 - 349</td>
<td>13.90</td>
</tr>
<tr>
<td></td>
<td>350 +</td>
<td>13.70</td>
</tr>
</tbody>
</table>

a. What is the period you will use for this analysis?

b. For supplier A, answer the following questions.
   i. What are the period carrying costs for each quantity break?

   ii. What is the optimal ordering quantity?

   iii. What is the common EOQ?

   iv. What is the total cost for the common EOQ?

   v. How many orders per period will the company make?

   vi. What is the total cost for the optimal solution?

c. For supplier B, answer the following questions.
   i. What are the period carrying costs for each quantity break?
ii. What is the optimal ordering quantity?

iii. What is the common EOQ?

iv. What is the total cost for the common EOQ? You do not have to calculate this manually. Hint, figure out how the template can automatically give it to you.

v. How many orders per period will the company make?

vi. What is the total cost for the optimal solution?

d. Which supplier should the company choose? Why?