

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.

<u>Number of Boxes</u>	<u>Price per Box</u>
1,000 to 1,999	\$1.25
2,000 to 4,999	\$1.20
5,000 to 9,999	\$1.15
10,000 or more	\$1.10

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?

#7: 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.

<u>Supplier A</u>	
<u>Quantity</u>	<u>Unit Price</u>
1 - 199	\$14.00
200 - 499	13.80
500 +	13.60

<u>Supplier B</u>	
<u>Quantity</u>	<u>Unit Price</u>
1 - 149	\$14.10
150 - 349	13.90
350 +	13.70

- 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?