**Chapter 20 Exercise**

1. The following information applies to Labs Plus, which supplies microscopes to laboratories throughout the country. Labs Plus purchases the microscopes from a manufacturer which has a reputation for very high quality in its manufacturing operation.

 Annual demand (weekly demand=1/52 of annual demand) 20,800 units

 Orders per year 20

 Lead time in days 15 days

 Cost of placing an order $100

What is the reorder point?

1. Managing inventories to increase net income requires companies to effectively manage costs associated with goods for sale.

**Required:**

Classify the below listed items as either **Purchasing Costs**, **Ordering Costs**, **Carrying Costs**, **Stockout Costs,** **Costs of Quality**, or **Shrinkage Costs**.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a. costs of obtaining purchase approvals

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b. costs resulting from embezzlement by employees

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c. internal failure costs

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d. opportunity cost of the investment tied up in inventory

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ e. spoilage of stored items

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ f. costs of lost sales as a result of not having an item requested by a customer

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g. costs of incoming freight

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ h. costs of matching invoices received to the items and the purchase orders

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ i. costs of wages for work-in-process inspections

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ j. costs that result from clerical errors

1. The Wood Furniture company produces a specialty wood furniture product, and has the following information available concerning its inventory items:

 Relevant ordering costs per purchase order $300

 Relevant carrying costs per year:

 Required annual return on investment 10%

 Required other costs per year $2.80

Annual demand is 20,000 packages per year. The purchase price per package is $32.

1. What is the economic order quantity?

1. What are the relevant total costs at the economic order quantity?
2. What are the total relevant costs, assuming the quantity ordered equals 1,000 units?
3. How many deliveries will be required at the economic order quantity?
4. If Brian Company has a safety stock of 320 units and the average daily demand is 20 units, how many days can be covered if the shipment from the supplier is delayed by 12 days?
5. If Jackson Collectibles, Inc. has a safety stock of 70 units and the average weekly demand is 14 units, how many days can be covered if the shipment from the supplier is delayed ?
6. Due to unprecedented growth during the year, Flowers by Kelly decided to use some of its surplus cash to increase the size of several inventory order quantities that had been previously determined using an EOQ model.

**Required:**

Identify whether increasing the size of inventory orders will increase, decrease, or have no effect on each of the following items.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a. Average inventory

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b. Cost of goods sold

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c. Number of orders per year

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d. Total annual carrying costs

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ e. Total annual carrying and ordering costs

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ f. Total annual ordering costs

1. The only product of a company has an annual demand of 4,000 units. The cost of placing an order is $20 and the cost of carrying one unit in inventory for one year is $4.

**Required:**

Determine the economic order quantity.

1. Clothes, Inc., has an average annual demand for red, medium polo shirts of 25,000 units. The cost of placing an order is $80 and the cost of carrying one unit in inventory for one year is $25.

**Required:**

1. Use the economic-order-quantity model to determine the optimal order size.

1. Determine the reorder point assuming a lead time of 10 days and a work year of 250 days.

1. Determine the safety stock required to prevent stockouts assuming the maximum lead time is 20 days and the maximum daily demand is 125 units.
2. Party Animals sells stuffed tigers. Products, Inc., manufactures many different stuffed animals. Party Animals orders 10,400 tigers per year, 200 per week, at $10 per tiger. The manufacturer covers all shipping costs. Party Animals earns 12% on its cash investments. The purchase-order lead time is 3 weeks. Party Animals sells 210 tigers per week. The following data are available (based on management's estimates):

 Estimated ordering costs per purchase order $10

 Estimated insurance, materials handling, breakage,

 and so on, per year $3

 Actual ordering costs per order $15

What is the economic order quantity using the estimated amounts?

1. Flashdrive Company sells 200 flash drives per week. Purchase-order lead time is 1-1/2 weeks and the economic-order quantity is 450 units. What is the reorder point?
2. Owen-King Company sells optical equipment. Lens Company manufactures special glass lenses. Owen-King Company orders 5,200 lenses per year, 100 per week, at $20 per lens. Lens Company covers all shipping costs. Owen-King Company earns 30% on its cash investments. The purchase-order lead time is 2.5 weeks. Owen-King Company sells 125 lenses per week. The following data are available:

 Relevant ordering costs per purchase order $21.25

 Relevant insurance, materials handling, breakage,

 and so on, per year $ 2.50

1. What is the economic order quantity for Owen-King Company?
2. What is the reorder point?

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