Question 1 (1 point)

Which of the following statements regarding the EOQ is true ?

(Select the best answer)

- If the unit ordering cost doubles, the EOQ increases.
- If annual demand doubles, the EOQ increases.
- If the unit holding cost increases, the EOQ decreases.
- If annual demand doubles, the number of orders per year increases.
- All of the above are true.

Question 2 (1 point)

A disadvantage of the fixed-period inventory system is that

- additional inventory records are required.
- since there is no order of inventory during the review period, a stockout is possible.
- it involves higher ordering costs than the fixed quantity inventory system.
- the average inventory level is decreased.

Question 3 (1 point)

Which one of the following statements represents an advantage of the *P* system over the *Q* system?

- Orders can be more easily combined to the same supplier.
- Less safety stock is carried to achieve the same service level.
- A *P* system is more suitable for quantity discounts and capacity limitations.
- In a periodic review system, the value of *Q* is kept the same from one cycle to another.
- The replenishment intervals can be more easily individualized for items.

Question 4 (2 points)

The Home and Garden (HG) chain of stores (HG) imports decorative planters from Italy. Weekly demand averages 2,000 planters. HG pays its Italian supplier $10 per planter. Capital cost at HG is estimated to be 25%. Each order from Italy costs $10,000 to HG (transportation, customs, inspection, etc.) Assume **52** weeks in one year.

Compute the EOQ for HG.

(Round your final answer to zero decimals)

Your Answer:

Answer

Question 5 (2 points)

A retailer of fine crystal has decided to stock a commemorative bird for the New Year. Each bird will retail for **$200**. At that price, demand for the season is expected to follow a normal distribution with a mean of **10,000** and a standard deviation of **275**.

The retailer will purchase the crystal birds from a manufacturer who charges **$80** per bird. The retailer can only place one order with the manufacturer in October. The order is delivered in mid-November. Any unsold birds after the New Year are discounted down to **$40**, and they all sell at this price. However, if the retailer sells out before the new year, there is no way to get additional birds.

Use the Newsvendor model to estimate how many birds the retailer should order in October.

Round your final answer to zero decimals.

Your Answer:

Answer

Question 6 (2 points)

The annual demand, ordering cost, and the inventory carrying cost rate for a certain item are D = 600 units, S = $20/order and I = 30% of item price. Price is established by the following quantity discount schedule. What should the order quantity be in order to minimize the total annual cost?

Quantity	1 to 49	50 to 249	250 and up
Price	$5.00 per unit	$4.50 per unit	$4.10 per unit

- The firm should order 250 units at a time
- The firm should order 150 units at a time
- The firm should order 200 units at a time
- The firm should order 300 units at a time

Use the fallowing information to answer the next 2 questions.

A company sells 600 bottles of a dietary supplement per week at $100 per bottle. The supplement is ordered from a supplier who charges the company $30 per order and $50 per bottle. The company's annual holding cost percentage is 40% of bottle's purchase price. Assume that the company operates 50 weeks in a year.

Question 7 (2 points)

What is the company's total ordering and holding cost per year if it orders 500 bottles at a time?

Do not include any sign or decimal points in your final answer (i.e. 12 instead of 12.0)

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Question 8 (2 points)

What order quantity minimizes Company's total ordering and holding cost per year?

Do not include any sign or decimal points in your final answer (i.e. 12 instead of 12.0)

units

Biofuel is any fuel that is derived from biomass, which is, plant or algae material or animal waste. Since such material can be replenished readily, biofuel is considered to be a source of renewable energy. BCBiofuel Inc. is a Canadian biofuel company in British Columbia. BCBiofuel orders raw material every week that is used in the biofuel production process to produce renewable, clean fuel. The weekly demand for their fuel is forecasted to be normally distributed with a mean of 250,000 gallons and a standard deviation of 125,000 gallons. The company sells the fuel for $25 per gallon. The company purchases the raw material for $10 per gallon and must spend $5 per gallon to dispose of unused raw material at the end of the week due to federal government regulations. Assume one gallon of raw material yields one gallon of biofuel. If the weekly demand for fuel is more than what the company can produce, then the company only sells what they made and the rest of the demand is lost.

Consider a **weekly** time frame for questions below.

a) Suppose BCBiofuel purchases 150,000 gallons of raw material. What is the probability that they will run out of raw material ? (2 points)

b) Suppose BCBiofuel purchases 300,000 gallons of raw material. How many gallons of demand on average would remain unfulfilled ? (2 points)

c) Suppose BCBiofuel purchases 400,000 gallons of raw material. How much should they expect to spend on disposal costs ? (2 points)

d) Suppose Biofuel wants to ensure that there is a 92% probability that they will be able to satisfy the customer's entire demand. How many gallons of raw material should they purchase? (2 marks)

e) How many gallons should Biofuel purchase to maximize its expected profit? (2 marks)

Question 10 (7 points)

Back in the 1970s, Fun Colours, a paint retailer in Peterborough, provided a variety of colours to its customers: they stocked one-gallon cans of paint in **75** different colours. Moreover, they kept enough cans of each colour to ensure a service level of **98%** for each colour. The weekly demand forecast per colour followed a normal distribution with a mean of **100** cans per week and a standard deviation of **40**. The store ordered their paint from a factory in Toronto at a unit cost of **$3.50** per can. The delivery lead time was **2** weeks. Assume **50** weeks in a year.

Round your final answers to zero decimals.

[2 point] How much safety stock of *each* colour was required to support Fun Colours' service level?

[2 point] If cost of capital for Fun Colors was **20%** per year, what was their annual holding cost for safety stock for *all* colors?

A few years later a new technology allowed for in-store customization of colour. A small amount of colouring agents would be mixed in a can of neutral coloured paint. Consequently, the store only needed to stock one-gallon cans of neutral coloured paint since the equipment included the colouring agents for the 75 colours. Demand, unit costs, capital cost, service level and lead time remained the same.

[3 points] What was the resulting annual holding cost for safety stock for the neutral coloured paint? Based on your previous answer, how much could they save with the new technology?