Inventory and annual holding cost

1. Your firm uses a continuous review system and operates 52 weeks per year. One of the SKUs has the following characteristics. Demand (D) = 20, 000 units/year

   Ordering cost (S) = $40/order

   Holding cost (H) = $2/unit/year

   Lead time (L) = 2weeks

   Cycle-service level = 95%

   Demand is normally distributed with a standard deviation of weekly demand of 100 units. The current on-hand inventory is 1. 040 units with no scheduled receipts and no backorders. 1. Calculate the item's EOQ. What is the average time, in weeks between orders? EOQ = (2DS)/H

- EOQ = (2*20000*40)/2
- EOQ = 800000
- EOQ = 894. 43894
- TBO = (EOQ/D)*52weeks
- TBO = (894/20000)*52weeks
- TBO = (0. 0447)*52weeks
- TBO = 2. 32442. 32weeks

2. Find the safety stock and reorder point that provides a 95% cycle-service level. Safety stock = Z*(standard deviation of demand during the lead time) Z for 95% service level is 1. 64

- Safety stock = 1. 64*(2*100)
- Safety stock = 328 units

Reorder point = (Average demand during lead time) + (Safety Stock)

Reorder point = ((20000/52weeks)*2) + 328 = 1097. 23 1097

3. For these policies, what are the annual costs of holding the cycle inventory and placing orders?

Annual holding cost = (Average cycle inventory)*(Unit holding cost)

Annual holding cost = (Average Lot size/2)*(Unit holding cost)

- Annual holding cost = ((20000/52weeks)*2. 32weeks)/2 * 2
- Annual holding cost = (892. 30 892/2)*2
- Annual holding cost = 446*2 = $892
- Annual ordering cost = (Number of orders/year)*(Ordering cost)
- Annual

  ordering cost = (Demand/Average lot size)*(Ordering cost)
- Annual ordering costs = (20000/892)*(40)
- Annual ordering costs = 22. 42*40 = $896. 8

4. Withdrawal of 15 units just occurred. Is it time to reorder? If so, how much should be ordered?

Inventory position = on hand inventory + schedule receipts – backorders
Inventory position = 1040+15+0= 1055

IP (1055) < R (1097) so new order must be placed

Order quantity: Target inventory level – Inventory position

Target inventory level = Average demand during the protection interval + Safety stock Target inventory level =

(Demand/52weeks)*((EOQ/Demand)*52weeks)*(Lead time) + Safety Stock

Target inventory