1. **(30 points)** A beverage company has a soft drink product that has a constant annual demand rate of 3,600 cases. A case of the soft drink costs the company $3. Ordering costs are $20 per order and holding costs are 25% of the value of the inventory and the lead time is 5 days.

   (a) (5 points) What is the economic order quantity for the product? What is the total annual cost (including variable order cost) associated with this quantity?
   
   (b) (5 points) Assuming fairly stable demand throughout the year, what is the reorder point?
   
   (c) (5 points) What is the cycle time (the time between two orders)?
   
   (d) (5 points) What is the cycle time if the lead time is 60 days?
   
   (e) (10 points) Suppose the company policy requires that the cycle time can only be a multiple of 30 days (30 days, 60 days, 90 days, etc.). What is the optimal cycle time and order quantity under this constraint?

2. **(15 points)** A company produces a certain product whose demand is fairly constant at 10 units a week. The cost of placing an order, including delivery charges, is estimated to be $150. The company aims for 20% annual return on assets employed. The supplier of the item charges a basic price of $250 per unit, with all-units discounts of 10% on orders of 50 units or more, 15% on orders of 150 units or more, and 20% on orders of 500 units or more. What is the optimal order quantity for the item?