**Basic EOQ Model**

Total Cost = \( A \cdot c + \frac{A}{Q} \cdot S + \frac{Q}{2} \cdot i \cdot c \)

\( H = i \cdot c \)

\( EOQ = \sqrt{\frac{2AS}{ic}} \)

with

- \( A = \) annual demand/usage [units/year]
- \( c = \) unit acquisition cost [$/unit]
- \( S = \) ordering/setup cost [$/order]
- \( i = \) annual carrying cost rate
- \( H = \) carrying cost per average unit of inventory per year [$/unit/year]
- \( TRC = \) total relevant cost

**Reorder Point for Basic EOQ Model**

\( ROP = \bar{d}L \)

with

- \( \bar{d} = \) average daily or weekly demand [units/day or units per week]
- \( L = \) leadtime [# of working days or weeks]

**Order Cycle Time, or Time Between Orders (TBO)**

\( TBO = \frac{Q}{A} \cdot (# \ of \ working \ days/\ year) \)

\( or \ \frac{Q}{A} \cdot (# \ of \ working \ weeks/\ year) \)

**Monetary Unit Lot Size Model**

\( EOQ = \sqrt{\frac{2ADs}{i}} \)

with

- \( A_D = \) annual usage in dollars

**Period-Order Quantity (POQ)**

\( POQ = \frac{EOQ}{average \ weekly \ usage} \)

**EOQ with Transfer Batches (Non-Instantaneous Replenishment)**

Total Cost

\( = A \cdot c + \frac{A}{Q} \cdot S + \frac{Q}{2n} \cdot i \cdot c \)

\( EOQ = \sqrt{\frac{2nAS}{ic}} \)

with

- \( n = \) number of transfer batches

**EOQ with Usage During Production**

Total Cost

\( = A \cdot c + \frac{A}{Q} \cdot S + \frac{p-d}{p} \cdot \frac{Q}{2} \cdot i \cdot c \)

\( EOQ = \sqrt{\frac{2AS}{ic}} \cdot \frac{p}{p-d} \)

with

- \( p = \) daily/weekly production rate
- \( d = \) daily/weekly usage rate
Reorder Point for Fixed Order Quantity Model with Safety Stock

\[ ROP = DDLT + SS \]
\[ = \bar{d}L + z\sigma_L \]
\[ \sigma_L = \sqrt{L \cdot \sigma_d} \]

where
DDLT = demand during leadtime
SS = safety stock
\( z \) = safety factor associated with the service level
\( \sigma_d \) = standard deviation of daily [or weekly] demand

Note: You will be provided a clean copy during the exercise.