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$$\begin{aligned}\text{Associated cost} &= \sqrt{2C_1C_3\lambda} \\ &= \sqrt{2 \times 0.05 \times 100 \times 30} \\ &= \sqrt{1500} \\ &= 38.729\end{aligned}$$

$$\begin{aligned}\text{LOT} &= q_0 / \lambda \\ &= 1095.4130 \\ &= 36.513\end{aligned}$$

$$\begin{aligned}\lambda &= 40 \text{ units} \\ C_1 &= 0.01 \text{ per unit} \\ C_3 &= 100 \text{ per order}\end{aligned}$$

$$\begin{aligned}\text{ELS} &= \sqrt{(2 \times 100 \times 40)} / 0.01 \\ &= \sqrt{8000} / 0.01 \\ &= 89.4427 / 0.01 \\ &= 8944.27\end{aligned}$$

$$\begin{aligned}\text{ATC} &= \sqrt{C_2C_1C_3\lambda} \\ &= \sqrt{(2 \times 0.01 \times 100 \times 40)} \\ &= \sqrt{80} \\ &= 8.94427\end{aligned}$$

$$\begin{aligned}\text{LOT} &= 8944.27 / 40 \\ &= 223.61\end{aligned}$$

$$\lambda = 20 \text{ units}$$

$$C_1 = 0.04 \text{ per unit}$$

$$C_3 = 100 \text{ per order}$$

$$\begin{aligned} EIS &= \sqrt{(2C_3\lambda)/c} \\ &= \sqrt{2 \times 100 \times 20 / 0.04} \\ &= \sqrt{4000 / 0.04} \\ &= 63.2455 / 0.04 \\ &= 1581.14 \end{aligned}$$

$$\begin{aligned} KTC &= \sqrt{(2C_1C_3\lambda)} \\ &= \sqrt{2 \times 0.04 \times 100 \times 20} \\ &= \sqrt{160} \\ &= 12.649 \end{aligned}$$

Q2

$$C_0 = 36 \quad C = 2 \quad D = 10000 \quad ch = 18\% \text{ of } 2 = \frac{18 \times 2}{100} = 0.36$$

$4/25$

$$Q^* = \sqrt{\frac{2 \times 10000 \times 36 \times 25}{9}} = \sqrt{2000000} = 1414 \text{ units}$$

$$\frac{D}{Q^*} = \frac{10000}{1414} = 7.072$$

Q1

A Data $\Rightarrow \lambda = 30$ units per year

$C_1 = 0.05$ per year

$C_3 = \text{Rs } 100$ per order

$$\begin{aligned}\text{Economic lot size} &= q_0 = \sqrt{\frac{2C_3\lambda}{C_1}} \\ &= \sqrt{\frac{2 \times 100 \times 30}{0.05}} \\ &= \sqrt{6000 / 0.05} \\ &= 77.459 / 0.05 \\ &= 1549.18 \text{ units per order}\end{aligned}$$

$$\begin{aligned}\text{Associated total costs} &= C_0 = \sqrt{2C_1C_3\lambda} \\ &= \sqrt{2 \times 0.05 \times 100 \times 30} \\ &= \sqrt{3000} \\ &= 54.77\end{aligned}$$

$$\begin{aligned}\text{Length of time between orders} &= q_0 / \lambda \\ &= 1549.18 / 30 \\ &= 51.639\end{aligned}$$

B Using $\lambda = 30$ units per year

$C_1 = 0.05$ per unit

$C_3 = 50$ per ~~unit~~ order

$$\begin{aligned}\text{EOQ} &= \sqrt{\frac{2C_3\lambda}{C_1}} \\ &= \sqrt{\frac{2 \times 50 \times 30}{0.05}} \\ &= \sqrt{3000 / 0.05} \\ &= 54.77 / 0.05 \\ &= 10954 \text{ units}\end{aligned}$$