

# Solutions

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$$\lambda = 30 \text{ units/year}$$

$$C_1 = 0.05 / \text{unit}$$

$$C_3 = 2500 / \text{order}$$

$$\text{Economic Lot size} = \sqrt{\frac{(2C_3\lambda)}{C_1}} = \frac{\sqrt{(2 \times 2500 \times 30)}}{0.05}$$

$$\Rightarrow \sqrt{6000} / 0.05$$

$$\Rightarrow 77.459 / 0.05$$

$$\Rightarrow 1549.18 \text{ units/order}$$

$$\begin{aligned} \text{Associated total cost} &= \sqrt{(2C_1C_3\lambda)} \\ &= \sqrt{2 \times 0.05 \times 2500 \times 30} \\ &= 54.77 \end{aligned}$$

$$\begin{aligned} \text{length of time between orders} &= \frac{Q_0}{\lambda} = \frac{1549.18}{30} \\ &= \underline{\underline{51.64}} \approx 52 \text{ days} \end{aligned}$$

13)  $\lambda = 30 \text{ units/year}$ ,  $C_1 = 0.05 / \text{unit}$ ,  $C_3 = 2550 / \text{order}$

$$E L_3 = \sqrt{(2C_3\lambda)} / C_1$$

$$= \sqrt{2 \times 2550 \times 30} / 0.05$$

$$= \sqrt{3000} / 0.05$$

$$= 54.772 / 0.05 = 1095.44 \text{ units/order}$$

$$\begin{aligned} \text{Associated total cost} &= \sqrt{(2C_1C_3\lambda)} = \sqrt{2 \times 0.05 \times 2550 \times 30} \\ &= \sqrt{1500} = 12.247 // \end{aligned}$$

length of time between orders =  $Q_0 / \lambda$

$$= 1095.44 / 30 = 36.514 \approx 37 \text{ days}$$

(1c)  $C_3 = \text{Rs } 100 / \text{order}$ ,  $\lambda = 40 / \text{year}$ ,  $C_1 = 0.01 / \text{unit}$

$$E L S = \sqrt{2 C_3 \lambda / C_1}$$

$$\sqrt{2 \times 100 \times 40 / 0.01}$$

$$\sqrt{8000 / 0.01}$$

$$89.4427 / 0.01$$

$$= 8944.27$$

Associated total cost =  $\sqrt{2 C_1 C_3 \lambda} = \sqrt{2 \times 0.01 \times 100 \times 40}$

$$= \sqrt{80} = 8.944$$

LOT between orders =  $Q_0 / \lambda = \frac{8944.27}{40}$

$$= 223.607 \approx 224 \text{ days}$$

1 D,  $C_1 = \text{Rs } 0.04 / \text{unit}$ ,  $C_3 = \text{Rs } 150 / \text{order}$

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

$$E L S = \sqrt{\quad}$$

$$Q_0 = \sqrt{2 \times 150 \times 20 / 0.04}$$

$$\sqrt{4000 / 0.04}$$

$$= 63.246 / 0.04$$

$$= 1581.15 \text{ units / order}$$

Associated total cost  $C_0 = \sqrt{2 C_1 C_3 \lambda}$

$$= \sqrt{2 \times 0.04 \times 100 \times 20}$$

$$= \sqrt{160} = 12.649$$

length of time  $\Rightarrow Q_0 / \lambda = \frac{1581.15}{20} = \underline{\underline{79.1}}$

②  $\lambda = \text{~~1000~~ } 10,000 \text{ units / annum}$

$C_3 = \text{Rs } 36.$

~~ICC~~ = 78%

$$Q_0 = \sqrt{2 \times 36 \times 10000} \quad f \quad 2 \times 0.18$$

$$= \sqrt{720,000} \quad | \quad 0.36$$

$$848.528 \quad | \quad 0.36$$

$$= 2357.02$$

③ no of orders =  $\lambda / Q_0$

$$= 10,000 / 2357.02$$

$$= 4.24$$