

Saved Photos

Name: Uye Tambygin
Course code: CSC 319
Date No: 19/12/2021

Question 1

a. Books cost L per order, $C_2 = \text{Rs } 0.05$ per unit and $T = 30$ units per year

Solution:
Economic lot

$$Q_0 = \sqrt{\frac{2 \times C_2 \times T}{C_1}} \times C_1$$

$$Q_0 = \sqrt{\frac{2 \times 100 \times 30}{0.05}}$$
$$= 1549.2 \text{ units}$$

ii. The associated total cost

$$C_0 = \sqrt{2 \times C_2 \times C_1 \times T}$$
$$= \sqrt{2 \times 100 \times 0.05 \times 30}$$
$$\text{Rs } 17.3$$

Total cost including material cost = $80 \times 1 + 17.3 = 97.3$
 $= \text{Rs } 97.3$ per year

iii. Length of time between orders

$$t_0 = Q_0 / T$$

$$= 1549.2 / 30$$

$$= 51.64 \text{ years between orders}$$

b $C_3 = \text{Rs } 50/\text{order}$ - per order, $C_4 = \text{Rs } 0.05$ per unit
units per year.

Solution:

$$1) \quad q_0 = \sqrt{(2GT)/C_3}$$
$$q_0 = \sqrt{(2 \times 50 \times 30)} / 0.05$$
$$= 1095.4 \text{ units}$$

$$2) \quad G = \sqrt{2 \times C_3 \times C_1 \times T}$$
$$= \sqrt{2 \times 50 \times 0.05 \times 30}$$
$$= \text{Rs } 12.2$$

Total cost including material cost

$$= 30 \times 1 + 12.2 = 42.2$$

Rs 42.2 / per year.

$$t_0 = q_0 / T$$

$$1095.4 \div 30$$

$$= 36.5 //$$

Question 2

$T = 10,000$ units per annum. $C_3 = \text{Rs } 36$ $P = \text{Rs } 20$
 $C_1 = 15\%$.

$$2) \quad q_0 = \sqrt{(2 \times 36 \times 10000)} / (2 \times 0.15)$$
$$= \sqrt{720000} / 0.30$$
$$= 2359.02 //$$

$$\begin{aligned}
 \text{Number of orders} &= 7190 \\
 &= 10,000 / 2357.02 \\
 &= 9.24
 \end{aligned}$$

$$\begin{aligned}
 \text{Order period} &= 20 / 7 \\
 &= 2357.02 / 10,000 \\
 &= 0.24 \text{ years} \\
 &= 365 \times 0.24 \\
 &= 87.6 \text{ days}
 \end{aligned}$$

$C_3 = \text{Rs. } 100$ per order, $C_1 = \text{Rs. } 0.04$ per unit and
 $T = 20$ units per year.

Solution.

$$\begin{aligned}
 Q_0 &= \sqrt{(2(3 \times 7) / 0.04)} \\
 &= \sqrt{(2 \times 100 \times 20)} \times 0.04 \\
 &= 1581.1 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 C_0 &= \sqrt{2(64)} \\
 &= \sqrt{2 \times 100 \times 0.04 \times 20} \\
 &= \text{Rs. } 12.7
 \end{aligned}$$

$$\begin{aligned}
 \text{Total cost including material cost} \\
 &= 20 \times 12.7 \\
 &= \text{Rs. } 32.7 \text{ / per year}
 \end{aligned}$$

$$t_0 = Q_0 / T$$

$$= 158.1 / 20$$

$$= 7.905 \text{ years between orders}$$

$C_3 = \text{Rs } 100$ / - per order, $C_4 = 0.01$ per unit and $T_0 = 40$ units per year.

Solution.

$$Q_0 = \sqrt{(2 \times C_3 \times T) / C_4}$$

$$= \sqrt{(2 \times 100 \times 40) / 0.01}$$

$$= 8944.3 \text{ units}$$

$$I_0 = \sqrt{2 \times C_3 \times C_4 \times T}$$

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

$$= \text{Rs } 8.9$$

Total cost including material cost

$$40 \times 1 + 8.9$$

$$\text{Rs } 48.9 / \text{per year}$$

$$t_0 = Q_0 / T$$

$$= 8944.3 / 40$$

$$= 223.6 \text{ years between orders}$$