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17/SCI01/036
CSE

Answers

1a) $C_3 = R_3 \cdot 100$ /- per order, $C_1 = R_e \cdot 0.005$ per unit
and $\lambda = 30$ units per year

Solution

i) Economic lot size

$$q_0 = \sqrt{(2 C_3 \times \lambda)} / C_1$$

$$q_0 = \sqrt{(2 \times 100 \times 30)} / 0.05$$

$$= 1549.2 \text{ units}$$

ii) The associated total costs

$$C_0 = \sqrt{2 \times C_3 \times C_1 \times \lambda}$$

$$= \sqrt{2 \times 100 \times 005 \times 30}$$

$$= R_3 17.3$$

Total cost including material cost $= 30 \times 1 + 17.3 = 47.3$

$= R_3 47.3$ /per year

iii) Length of time between order

$$t_0 = q_0 / \lambda$$

$$= 1549.2 / 30$$

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

b) C_3 = Rs 50/- Per order, C_1 = Re 0.05 per unit and annual demand = 30 units per year

Solution

i) $q_0 = \sqrt{(C_2 \times C_3 \times \lambda)} / C_1$

$q_0 = \sqrt{(2 \times 50 \times 30)} / 0.05$

1095.4 units

ii) $C_0 = \sqrt{2 \times C_3 \times C_1 \times \lambda}$

$= \sqrt{2 \times 50 \times 0.05 \times 30}$

$=$ Rs $= 12.2$

Total cost including material cost $= 30 \times 1 + 12.2 = 42.2$

$=$ Rs 42.2 / per year

iii) $t_0 = q_0 / \lambda$

$1095.4 / 30 = 36.5$

2) $\lambda = 10,000$ units per annum $C_3 = Rs.\ 36$

$P = Rs\ 2/-$ $C_1 = 18\%$

Solution

a) $q_0 = \sqrt{(2 \times 36 \times 10,000) / 2 \times 0.18)}$

$= \sqrt{720,000} / 0.30$

$= 2357.02$

b) number of order $= \lambda / q_0$

$= 10,000 / 2357.02$

$= 4.24$

Order period $= q_0 / \lambda$

$= 2357.02 / 10,000$

$= 0.24$ of years

$= 365 \times 0.24$

$= 87.6$ days

c) $C_3 = Rs.100$ / per orders, $C_1 = Rs\ 0.04$ per unit an

$\lambda = 20$ units per year

Solution

a) $q_0 = \sqrt{2 C_3 \times \lambda} / C_1$

$= \sqrt{(2 \times 100 \times 20)} / 0.04$

$= 1551.1$ units

ii) $C_0 = \sqrt{2 C_3 C_1 \lambda}$

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

$=$ Rs 12.7

Total cost including material cost

$= 20 \times 1 + 12.7$

$=$ Rs 32.7 per year

iii) $t_0 = q_0 / \lambda$

$= 158.1 / 20$

$= 7.9.1$ years between orders

E) $C_3 =$ Rs. 100/- per order, $C_1 = 0.01$ per unit one $\lambda = 40$ units per year

Solution

i) $q_0 = \sqrt{(C_2 C_3 \times \lambda) / C_1}$

$= \sqrt{(C_2 \times 100 \times 40) / 0.01}$

$= 8944.3$ units

ii) $C_0 = \sqrt{2 C_3 C_1 \lambda}$

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

$=$ Rs 8.9

~~Total cost mate~~

Total cost including material cost

= 40 × 1 + 8.9

= Rs 48.9/ per year

ii) to = 70/8

~~8944.3~~

= 8944.3 / 40

= 223.6 years between order