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1.) Find the economic lot size, the associate total costs and length of time between orders and give your comments

C_1 – the carrying cost
C_3 – the ordering cost
λ = demand.

(a) C_3 = Rs. 100/- per order, C_1 = Re. 0.05 per unit and λ = 30 units per year

Economic lot size $(q_0) = \sqrt{(2C_3\lambda)}/C_1$

$= \sqrt{2 \times 100 \times 30}/0.05 = 1549.19$ units per procurement

associated total costs

$C_0 = \sqrt{(2C_1C_3\lambda)} = \sqrt{(2 \times 0.05 \times 100 \times 30)}$

$= 17.32$

Total cost including material cost $(30 \times 100) + 17.32$

$= 8000 + 17.32 = 3017.32$ / per year

length of time between orders

$t_0 = 1/N$; but $N = \sqrt{(C_1 \times \lambda)}/2C_3 = \sqrt{(0.05 \times 30)}/2 \times 100$

$N = \sqrt{1.5}/200 = 6.124 \times 10^{-3}$

$t_0 = 1/N = 1/6.124 \times 10^{-3} = 163.29$ days

$\simeq 163$ days

Comments: The economic lot size is 1549.19 with a total cost of 3017.32 with 163 days between the orders

6) C_3 = RS. 500 Per order, C_1 = Re. 0.05 Per unit, λ = 30 units Per year

Economic lot size $(q_0) = \sqrt{2(C_3 \lambda)} / C_1$

$= \sqrt{2 \times 500 \times 30} / 0.05 = 3464.10$ units per order

associated total costs.

$C_0 = \sqrt{2 C_1 C_3 \lambda} = \sqrt{2 \times 0.05 \times 500 \times 30} = 38.73$

Total costs including material cost = $(30 \times 500) + 38.73$

$= 15000 + 38.73 = 15038.73$ per year

length of time between orders but we need N

$N = \sqrt{(C_1 \times \lambda)} / 2 C_3 = \sqrt{0.05 \times 30} / 2 \times 500 = 1.225 \times 10^{-3}$

$t_0 = 1/N = 816.5 \simeq 816$ days

Comments: The economic lot size is 3464.10 with a total cost of 15038.73 with 816 days between the order

c) $C_3 = Rs.100$ / per order, $C_1 = 0.01$ per unit

$\lambda = 40$ units per year

(i) Economic lot size $(Q_0) = \sqrt{2 C_3 \lambda} / C_1$

$= \sqrt{2 \times 100 \times 40} / 0.01 = 8944.27$ units per procurement

associated total cost,

$C_0 = \sqrt{2 C_1 C_3 \lambda} = \sqrt{2 \times 0.01 \times 100 \times 40} = 8.94$

Total costs including material cost $= (\lambda \times C_3) + C_0$

$= (40 \times 100) + 8.94 = 4008.94$ / per year

Length of time between orders but we need N

$N = \sqrt{C_1 \times \lambda} / 2C_3 = \sqrt{0.01 \times 40} / 2 \times 100 = 3.16 \times 10^{-3}$

$t_0 = 1/N = 316.23 \simeq 316$ days

Comments: the economic lot size is 8944.27 units per procurement with a total cost of 4008 per year and 316 days between orders

d) $C_3 = R_s.100$ / Pr Order. $C_1 = R_s.0.04$ Pr and an of

$\lambda = 20$ units Per year

) Economic lot size $(Q_0) = \sqrt{2 C_3 \lambda / C_1}$.

$= \sqrt{2 \times 100 \times 20} / 0.04 = 158.1 H$ units Per procurent

associated total cost

$C_0 = \sqrt{2 C_1 C_3 \lambda} = \sqrt{2 \times 0.04 \times 100 \times 20} = 12.65$

Total cost including material cost $= (\lambda \times (C_3) + C_0$

$= (20 \times 100) + 12.65 = 2012.65$ per year

length of time between order but we need N

$N = \sqrt{C_1 \times \lambda} / 2 C_3 = (\sqrt{0.04 \times 20}) / 2 \times 100 \cong 4.47 \times 10^{-3}$

$t_0 = 1/N = 223.6 \cong 224$ days

Comments: the economic lot size is 158.1 H Pr procurement which occurs every 224 days and has a total cost of 2012.65 per year

2) X12 manufacturing company :

Purchase cost = Rs. 36 per order
+ Rs. 2/- per part

Inventory carrying charge : 18% of average inventory (C_3)

demand : 10,000 units per year

$\lambda = 10,000$; $P = Rs.\ 2$ per part ; ~~$C_3 = Rs.\ 36/- i = 0$~~

$C_3 = Rs.\ 36/- i = 0.18$

(a) what is the economic order quantity in units

$q_0 = \sqrt{2 C_3 i P \cdot \lambda} =$

~~$\sqrt{2 \times 36 \times 0.18 \times 2 \times}$~~

$q_0 = \sqrt{(2 C_3 \lambda)/iP} = \sqrt{\frac{2 \times 36 \times 10000}{0.18 \times 2}} = 1414.21$ units

q_0 in rupees $= q_0 \times P = 1414.21 \times 2 =$ ~~2828~~

$= Rs.\ 2828$

b) what is the optimal number of days supply per optimum order

$t_0 = q_0 / \lambda = 1414 / 10000 = 0.1414$ year ~~$\times 12$~~

~~$= 1.6968$ month $\times 30 = 52.6$ days~~

λ / q_0 : optimal number of orders $= 7.072$

optimal ordering period $= 0.1414$ of a year $= 0.1414 \times 364$

$= 51.62 \simeq 52$ days

) $r = 6890$ items per year

cost carrying inventory $(C_1) = R_s.\ 2.6$ per item per year

the cost of set up $(C_3) = R_s\ 450$ / per production run

~~Rs 450~~ every week : 5 items more items get demanded

a) $t = 1$ year.

$\therefore C_1 = Rs\ 2.6$ / year

$C_3 = R_s.\ 450$ per production run

$r = 6890$ items per year

$$C_0 = \sqrt{2 C_1 C_3 r} = \sqrt{2 \times 2.6 \times 450 \times 6890}$$

$$= 4015.2 \text{ units} = R_s.\ 4015.3/-$$

b) $t = 6$ months $= 1/2$ year

$r = 3445$

$C_1 = R_s\ 2.6$ / year $\div 2 = R_s.\ 1.3$ / 6 months

$C_3 = R_s.\ 450$ per production run

~~$C_0 = \sqrt{}$~~

C (cost of 3445 now) $= \sqrt{2 C_1 C_3 r} = \sqrt{2 \times 1.3 \times 450 \times 3445}$

$= R_s.\ 2007.64$

Cost of 3445 later $= \sqrt{2 C_1 C_3 r} = \sqrt{2 \times 1.3 \times 450 \times 3445}$

$= R_s.\ 2007.64.$

Total yearly cost $= R_s.\ 4015.3/-$

c)

c) $t = 1/12$ year = one month

$r = 1/12 (6890)$ per month $= 574.17$ per month

C_1 Rs 2.6 Per year $/12 = 13/60$ Per month or 0.2167 per month

$C_3 = Rs.450$

C (cost of order per month) $= \sqrt{2 C_1 C_3 r}$

$= \sqrt{2 \times (13/60) \times 450 \times 574.17}$ = Rs 334.61 Per month

yearly $= 334.61 \times 12 = 4015.295$ per year

d) $t = 1/52$ year = a week

$r = 1/52 (6890)$ per week $= 132.5$ Per week

C_1 = Rs 2.6 Per year $/52$ = Rs 0.05 Per week

$C_3 = Rs.450$

C (cost of order per week) $= \sqrt{2 C_1 C_3 r}$

$= \sqrt{2 \times 0.05 \times 450 \times 13.5}$ = ~~Rs 24.65~~

$= Rs\ 77.22$

yearly $= 77.22 \times 52$ = Rs 4015.295