Material costing:

EOQ : Economic Order Quantity

Annual Usage 18000 units ­

Cost of placing an order Tk 12

Carrying cost as a percent of inventory 20% .

Cost per unit of material Tk 1.5 .

**Required** :

Determine the Economic Order Quantity mat

Mathematical way:

EOQ= Root over 2\*AD\*OC/CC

Root over 2\*18000\*12/20% of 1.5

=1200 units

Here

AD = Annual demand

Oc= Ordering cost

Cc= Carrying cost

Tabular Form:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No of order | 1 | 2 | 3 | 6 | 9 | 15 | 18 |
| Order size | 18000 | 9000 | 6000 | 3000 | 2000 | 1200 | 1000 |
| Average inventory= Order size /2 | 9000 | 4500 | 3000 | 1500 | 1000 | 600 | 500 |
| Average inventory value= Avg inv\* Cost per unit | 13500 | 6750 | 4500 | 2250 | 1500 | 900 | 750 |
| Carrying cost =20 % of Avg inv value | 2700 | 1350 | 900 | 450 | 300 | 180 | 150 |
| Ordering cost=No of order\* cost per order | 12 | 24 | 36 | 72 | 108 | 180 | 216 |
| Total cost | 2712 | 1374 | 936 | 522 | 408 | 360 | 366 |
|  |  |  |  |  |  |  |  |

Here 1200 order size is our EOQ level where carrying and ordering costs are same and total cost is lowest.

Ques: Basu & Das : Problem 8

Annual Usage 800 units ­

Cost of placing an order Tk100

Carrying cost as a percent of inventory 10% .

Cost per unit of material Tk 30 .

Rent, Insurance, Taxes etc per unit per annum Tk 1.

**Required** :

Determine the Economic Order Quantity mathematically and in tabular form

Ans:

Mathematical way:

EOQ= Root over 2\*AD\*OC/CC

Root over 2\*800\*100/ 10 % of 30 +1

=200 units

Here

AD = Annual demand

Oc= Ordering cost

Cc= Carrying cost

Tabular Form:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No of order | 1 | 2 | 4 | 8 | 10 | 16 |
| Order size | 800 | 400 | 200 | 100 | 80 | 50 |
| Average inventory= Order size /2 | 400 | 200 | 100 | 50 | 40 | 25 |
| Average inventory value= Avg inv\* Cost per unit | 400\*30=12000 | 6000 | 3000 | 1500 | 1200 | 750 |
| Carrying cost =10 % of Avg inv value+ rent ,tax, insurance cost Tk 1 per unit per annum | 12000\*10%=  1200  400\*1=400  =!600 | 600+200=  800 | 300+100=400 | 150+50=  200 | 120+40=  160 | 75+25=  100 |
| Ordering cost=No of order\* cost per order | 100 | 200 | 400 | 800 | 1000 | 1600 |
| Total cost | 1700 | 1000 | 800 | 1000 | 1160 | 1700 |
|  |  |  |  |  |  |  |

Here 200 order size is our EOQ level where carrying and ordering costs are same and total cost is lowest.

Matz Usry:284 ( Discount related problem)

Assume that annual usage of an inventory item is 3600 units costing Tk 1 each with no discount available .The carrying cost is 20 percent of the average inventory investment and the cost to place an order is Tk 10

The quantity discounts are

Order size Quantity discounts

1. 8%
2. 6%

1200 5%

900 5%

720 4.5%

600 4%

450 4%

Calculate EOQ mathematically and in tabular form

Mathematical way:

EOQ= Root over 2\*AD\*OC/CC

Root over 2\*3600\*10/ 20% of 1

=600 units

Here

AD = Annual demand

Oc= Ordering cost

Cc= Carrying cost

Tabular Form:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| List price/cost per unit | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Amount of discount | .08 | .06 | .05 | .05 | .045 | .04 | .04 |
| Discounted price per unit | .92 | .94 | .95 | .95 | .955 | .96 | .96 |
| No of order | 1 | 2 | 3 | 4 | 5 | 6 | 8 |
| Order size | 3600 | 1800 | 1200 | 900 | 720 | 600 | 450 |
| Average inventory= Order size /2 | 1800 | 900 | 600 | 450 | 360 | 300 | 225 |
| Average inventory value= Avg inv\* discounted price per unit | 1656 | 846 | 570 | 427.5 | 343.5 | 288 | 216 |
| Carrying cost =20 % of Avg inv value | 331.2 | 169.2 | 144 | 85.5 | 68.7 | 57.6 | 43.2 |
| Ordering cost=No of order\* cost per order | 10 | 20 | 30 | 40 | 50 | 60 | 80 |
| Material Cost=  Annual demand\* discounted price per unit | 3600\*.92  =3312 | 3384 | 3420 | 3420 | 3438 | 3456 | 3456 |
| Total cost | 3653.2 | 3573.2 | 3594 | 3545.5 | 3556.7 | 3573.6 | 3579.2 |

Here 900 order size is our EOQ level where total cost is lowest.