COST ACCOUNTING

TY. B. COM SEMESTER V
CHP 2- MATERIAL COST [CAS 6]

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Procedure

1. Purchase Requisition- issued by Stores or Production Dept. to Purchase Dept
2. Enquiries- by Purchase Dept to suppliers
3. Purchase Order- by Purchase Dept. to suppliers
4. Inspection Note- by Inspection Dept or Stores Dept. to supplier
5. Goods received Note- by Stores Dept.
6. Material Requisition Note- by Production Dept. to Stores Dept.
7. Bill of materials- issued by Planning dept. to Stores Dept.

EXHIBIT 1 : SPECIMEN PURCHASE REQUISITION

ABC COMPANY

PURCHASE REQUISITION

Sr. No. : x x Date : x x

To : Purchase Department / Officer

From : Stores / Production / x x Department

For : Job No. x x / Contract No. x x Batch No. x x

Item	Description	Code	Unit	Quantity	Delivery Date	Required Place
x x	x x x x	x x	x x	x x	x x	x x

Signature

x x

Manager

Action by Purchase Department / Officer

Enquiry No. x x Dated x x

Order No. x x Dated x x

x x

Signature

EXHIBIT 2 : SPECIMEN PURCHASE ORDER

ABC COMPANY

PURCHASE ORDER

Sr. No. : x x
Purchase Requisition No. : x x
Enquiry / Invitation for Tender No. : x x
Offer / Tender No. : x x

Date : x x
P. R. Date : x x
Date : x x
Date : x x

To : XYZ Company

Dear Sirs,

This has reference to your above offer / tender for the supply of materials.

We are pleased to accept your said offer / tender for the supply of the following materials on terms and conditions stated below.

Item	Description	Code	Unit	Quantity	Price	Amount
x x	x x x x	x x	x x	x x	x x	x x

Terms and Conditions :

1. Delivery : x x
2. Packing : x x
3. Terms of Payments : x x
4. Jurisdiction : Subject to Mumbai Jurisdiction

For Office Use only :

Goods Inspection Note No. x x Dated x x
Goods Received Note No. x x Dated x x
Purchase Invoice No. x x Dated x x

x x
Signature

Signature

x x
Manager
ABC Company

EXHIBIT 3 : SPECIMEN INSPECTION NOTE

ABC COMPANY

INSPECTION NOTE

Sr. No. : x x

Date : x x

Purchase Order No. : x x

P. O. Date : x x

Supplier's Name : x x

Supplier's Challan No. : x x

Challan Date : x x

Item	Description	Quantity	Remarks Accepted / Rejected	Reasons/ Rej. Code
x x	x x x x	x x		x x
x x	x x x x	x x		x x

Signature

x x

Inspector

For Office Use only :

Goods Returned Note No. x x Dated x x [Rejected Goods]

Goods Received Note No. x x Dated x x [Accepted Goods]

Purchase Invoice No. x x Dated x x [Accepted Goods]

x x

Signature

EXHIBIT 4 : SPECIMEN GOODS RECEIVED NOTE

ABC COMPANY

GOODS RECEIVED NOTE

Sr. No. : x x
Date : x x
Purchase Order No. : x x
P. O. Date : x x
Supplier's Name : x x
Supplier's Challan No. : x x
Date : x x
Inspection Note : x x
I. N. Date : x x
Received the following material :

Item	Description	Code	Unit	Quantity	Price	Amount
x x	x x x x	x x	x x	x x	x x	x x
x x	x x x x	x x	x x	x x	x x	x x

Signature

x x
Store Keeper
ABC Company

For Office Use only :

Posted in Bin Card on x x
Posted in Stock Ledger on x x
Purchase Invoice No. x x Dated x x

x x
Signature

EXHIBIT 5 : SPECIMEN MATERIAL REQUISITION NOTE

ABC COMPANY

MATERIAL REQUISITION NOTE

Sr. No. : x x Date : x x

Cost Centre / Department : x x

Job / Contract / Batch / Process No. : x x

Bill of Material No. : x x Date : x x

Particulars					Cost Accounts	
Item	Description	Code	Unit	Quantity	Rate ₹	Cost ₹
x x	x x x x	x x	x x	x x	x x	x x

Authorised Signature

For Office Use only :

Material Issued on x x

Posted in Bills of Material on x x

Posted in Bin Card on x x

Posted in Stock Ledger on x x

x x
Signature

x x
Manager
Cost Centre/Department

EXHIBIT 6 : SPECIMEN OF BILLS OF MATERIALS

ABC COMPANY

BILL OF MATERIALS

Sr. No. : x x

Date : x x

Cost Centre / Department : x x

Job / Contract / Batch No. : x x

Process Period : x x

Item	Description	Code	Unit	Quantity	Rate ₹	Cost ₹
x x	x x x x	x x	x x	x x	x x	x x

Authorised Signature

For Office Use only :

Material Requisition Note No. x x Dated x x Quantity x x

Material Requisition Note No. x x Dated x x Quantity x

Additional Bill of Materials No. x x Dated x x

x x

Manager

Planning Department

x x

Signature

2.4 FORMAT OF STOCK LEDGER

ABC COMPANY

STOCK LEDGER

Folio No. : x x
Code : x x

Description x x x x
Maximum Level x x
Minimum Level x x
Re-order Level x x
Re-order Quantity x x

Date	Document Ref. No.	Receipts		Issues		Closing Stock		On Order Q
		Q	Value	Q	Value	Q	Value	
x x	x x x x	x x	x x x	x x	x x x	x x	x x x	x x

EXHIBIT 9 : BIN CARD

ABC COMPANY

BIN CARD

Folio No. : x x

Code : x x

Description x x x x

Maximum Level x x

Re-order Level x x

Minimum Level x x

Re-order Quantity x x

Date	Document Ref. No.	Receipts Qty.	Issues Qty.	Closing Stock Qty.	On Order Qty.
x x	x x x x	xx x x x	xx x x x	xx x x x	x x

Valuation of Receipts

Include: Purchase price, Duties and Taxes, Freight Inwards, Insurance and other expenditure directly related to purchase of raw materials.

Exclude: Trade Discounts, Rebates, Taxes and Duties refundable.

Sr. no	Particulars
1	Maximum Consumption
2	Minimum Consumption
3	Average Consumption [(Max+Min) / 2]
4	Maximum Re-order period
5	Minimum Re-order period
6	Average Re-order period [(Max+Min) / 2]
7	Re-order Quantity
A	Re-order level= [1 X 4]
B	Maximum Level= [A + 7- (2 X 5)]
C	Minimum Level=[A - (3 X 6)]
D	Average Level= (Max level + Min level) / 2
E	Danger Level= Avg Consumption X Emergency Re-order period

ECONOMIC ORDER QUANTITY

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

Where,

A – Annual material used

O – Ordering cost (Cost to place each order)

C – Carrying Cost

EOQ- Economic Order quantity

C = Carrying cost percentage p.a. X Cost of one unit

or

C = Annual Carrying Costs / Average Inventory

Illustration 9 :

A manufacturer buys certain essential spares from outside suppliers at ₹ 40 per set. Total annual requirement are 45,000 sets. The annual cost of investment in inventory is 10% and cost like rent, stationery, insurance, taxes, etc. per unit per year works out to be ₹ 1. Cost of placing an order is ₹ 5.

Calculate :

1. The EOQ (By formula method)
2. No. of orders to be placed.

(T.Y.B.Com., Oct. 2014, adapted)

Solution

Solution :

A = Annual requirement = 45,000 sets

O = Ordering cost per order = ₹ 5

C = Carrying cost p.u. = ₹ 40 x 10/100 = ₹ 4 + ₹ 1 = **₹ 5**

$$\textbf{E.O.Q.} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 45{,}000 \times 5}{5}}$$

= **300 sets**

$$\textbf{No. of Orders} = \frac{\text{Annual Consumption}}{\text{EOQ}}$$

$$= \frac{45{,}000 \text{ sets}}{300 \text{ sets}}$$

= **150 orders**

Illustration 10 : (Semi-Annual)

From the following information, calculate Economic order quantity.

Semi-Annual Consumption 6,000 units

Purchase price of input unit ₹ 25

Ordering cost per order ₹ 45

Quarterly carrying cost 3%

Solution :

The formula for E.O.Q. = $\sqrt{\frac{2AO}{C}}$

Where

A = Annual usage in units = 6,000 x 2 = 12,000

O = Ordering cost per order = 45

C = Annual carrying cost of one unit = 25 x 3% x 4 = 3

Illustration 11 :

For direct material XXX the following details are available:

Average inventory level	200
Orders per year	40
Average daily demand	48
Working days per year	250
Annual ordering costs	₹ 4,000
Annual carrying costs	₹ 6,000

Required :

Determine the annual demand, the cost of placing an order, the annual carrying cost of one unit, and the economic order quantity.

Solution :

A = Annual demand = Daily Demand x Days per year = 48 x 250 = 12,000

O = Cost of placing an order = Ordering costs ÷ Orders = ₹ 4,000 / 40 = ₹ 100 per order

C = Carrying cost of one unit = Carrying costs ÷ Average inventory = ₹ 6,000 / 200 = ₹ 30 per unit

The formula for E.O.Q. = $\sqrt{\frac{2AO}{C}}$

E.O.Q. = $\sqrt{\frac{2 \times 12{,}000 \times 100}{30}}$ = **283 units (r/o)**

Illustration 12 : (Monthly Demand)

G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at ₹ 20. For every finished product, one unit of component is required. The ordering cost is ₹ 120 per order and the holding cost is 10% p.a. You are required to calculate the Economic order quantity.

Solution :

Economic order quantity :

A = Annual requirement = 4,000 units per month x 12 months = 48,000

O = Ordering cost per order = ₹ 120

C = Carrying cost = 10% x 20 = ₹ 2

$$E.O.Q. = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 48{,}000 \times 120}{2}}$$

= **2,400 units**

Illustration 13 :

The Purchase Manager of an organisation has collected the following data for one of the A class items.

Interest of the locked up capital	20%
Order processing cost (₹) for each order	₹ 100
Inspection cost per lot	₹ 50
Follow up cost for each order	₹ 80
Pilferage while holding inventory	5%
Other holding cost	15%
Other procurement cost for each order	₹ 170
Annual demand	1,000 units
Cost per item	₹ 10

What should be the EOQ ? ***(T.Y.B.Com., Nov. 2017, ICWA - Final, adapted)***

Illustration 14 :

A company manufactures a product from a raw material, which is purchased at ₹ 60 per kg. The company incurs a handling cost of ₹ 360 plus freight of ₹ 390 per order. The incremental carrying cost of inventory of raw material is ₹ 0.50 per kg. per month. In addition, the cost of working capital finance on the investment in inventory of raw material is ₹ 9 per kg per annum. The annual production of the product is 1,00,000 units and 2.5 units are obtained from one kg of raw material.

Calculate the economic order quantity of raw materials. ***(CA Inter, Nov. 2001, adapted)***

Solution :

A = Annual requirement of raw material in kgs.

= 1 kg x 1,00,000 units / 2.5 units = 40,000 kgs

O = Handling and Freight cost per order

= ₹ 360 + ₹ 390 = ₹ 750

C = Carrying cost per kg. per annum + Investment cost per kg. per annum

= (₹ 0.5 x 12 months) + ₹ 9 (Investment in inventory per kg. per annum)

= ₹ 15 per kg

$$\textbf{EOQ} = \sqrt{\frac{2 \times 40{,}000 \times 750}{15}} = \textbf{2,000 kgs}$$

Illustration 15 :

The following information relating to a type of raw material is available :

Annual demand	2,000 units
Unit price	₹ 20.00
Ordering cost per order	₹ 20.00
Storage cost	2% p.a.
Interest rate	8% p.a.

Calculate economic order quantity and total annual inventory cost of the raw material.

Solution :

(CA-IPCC, Nov. 2009, adapted)

$$\textbf{EOQ} = \sqrt{\frac{2AO}{C}} \quad \text{where } \textbf{A} = 2{,}000;\ \textbf{O} = 20;\ \textbf{C} = 20 \times 10\% = 2$$

$$= \sqrt{\frac{2 \times 2{,}000 \times 20}{2}} = \sqrt{\frac{80{,}000}{2}} = \textbf{200 units}$$

Total Annual Inventory Cost

Cost of 2,000 units @ ₹ 20 (2,000 x 20)	=	40,000
No. of Orders (2,000 ÷ 20) = 10		
Ordering Cost (10 x 20)	=	200
Carrying cost of Average Inventory {₹ 2 x (20 ÷ 2)}	=	200
	=	**40,400**

Illustration 16 :

X Ltd. manufactures a special product 'ZED' and provides the following information :

Demand of ZED is 1,000 units per month.

Semi-annual carrying cost - 6%

Raw-material required per unit of finished product - 2 kg

Ordering cost per order - ₹ 90

Purchase price of input unit - ₹ 25 per kg

Required : Calculate (a) Economic order quantity and (b) Total Annual Carrying and Ordering Cost at that quantity.

A = Annual Consumption of input = 1,000 x 12 x 2 = 24,000 kgs

O = Ordering cost per order = ₹ 90

C = Carrying cost per kg p.a. = ₹ 25 x 6% x 2 = ₹ 3

Total Annual Carrying and Ordering Costs

1. **No. of orders** = A / EOQ = 24,000 ÷ 1,200 = **20**
2. **Total ordering costs** = No. of orders x Order cost = 20 x 90 = **1,800**
3. **Total carrying costs** = $EOQ \times \frac{1}{2} \times C = 1{,}200 \times \frac{1}{2} \times 3 =$ **1,800**
4. **Total costs** = 1,800 + 1,800 = **3,600**; or

Total costs at EOQ = $\sqrt{2AOC} = \sqrt{2 \times 24{,}000 \times 90 \times 3}$ = **₹ 3,600**

Illustration 17 :

ABC Co. buys a lot of 125 boxes which is a three month supply. The cost per box is ₹ 125 and ordering cost is ₹ 250 per order. The inventory carrying cost is estimated at 20% of unit value per annum.

You are required to ascertain :

(i) The total annual cost of existing inventory policy.

(ii) How much money would be saved by employing economic order quantity ?

Solution :

(i) Total Annual Costs at Present

(a) Total Demand per annum **[A]** = $\frac{125}{3}$ x 12 = 500 Boxes

(b) Number of Orders = $\left[\frac{A}{Q}\right]$ = $\frac{\text{Annual Demand}}{\text{Quantity Ordered}}$ = $\frac{500}{125}$ = 4 Orders

(c) Total Ordering cost p.a. = No. of orders x Ordering cost

= 4 x ₹ 250 = **₹ 1,000**

(d) Total Carrying cost p.a. = Q x $\frac{1}{2}$ x Carrying cost

= $\frac{1}{2}$ x 125 x 20% of ₹ 125 = **₹ 1,562.50**

Total Annual Cost = ₹ 1,000 + ₹ 1,562.50 = **₹ 2,562.50**

(ii) Economic Order Quantity (EOQ) = $\sqrt{\frac{2AO}{C}}$ where,

A = Annual Demand = 500 boxes

O = Ordering Cost per order = ₹ 250

C = Carrying Cost per unit per annum = ₹ 125 x 20% = ₹ 25

$$EOQ = \sqrt{\frac{2 \times 500 \times 250}{25}} = \sqrt{10,000} = \textbf{100 boxes}$$

Total Annual Cost if EOQ is employed :	₹
(i) Order Cost = (500 / 100 x ₹ 250)	1,250
(ii) Carrying Cost = (1/2 x 100 x ₹ 25)	1,250
	2,500

Alternatively,

Total Annual Cost = $\sqrt{2 \times A \times O \times C}$

$= \sqrt{2 \times 500 \times 250 \times 25} = \sqrt{62,50,000} =$ **₹ 2,500**

If EOQ is employed, cost saving will be :	₹
Total annual cost under present policy	2,562.50
Total annual cost under EOQ	2,500.00
Saving in Cost	**62.50**

It is to be noted that under both the policies, the purchase cost per box will remain same. Therefore it has been ignored.

HW Sums

Illustration 18 :

ZED Company supplies plastic crockery to fast food restaurants in metropolitan city. One of its products is a special bowl, disposable after initial use, for serving soups to its customers. Bowls are sold in pack of 10 pieces at a price of ₹ 50 per pack. The demand for plastic bowl has been forecasted at a fairly steady rate of 40,000 packs every year. The company purchases the bowl direct from manufacturer at ₹ 40 per pack. The ordering and related cost is ₹ 8 per order. The storage cost is 10% per annum of average inventory investment.

Required :

(i) Calculate Economic Order Quantity

(ii) Calculate number of orders needed every year

(iii) Calculate the total cost of ordering and storage of bowls for the year.

Illustration 19 : (EOQ - 2 Items)

The Complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer: Super Grow and Nature's Own. The following information is collected.

Particulars	*Fertilizer*	
	Super Grow	*Nature's Own*
Annual Demand	2,000 Bags	1,280 Bags
Relevant ordering cost per purchase order	₹ 1,200	₹ 1,400
Annual relevant carrying cost per bag	₹ 480	₹ 560

Required:

(i) Compute EOQ for Super Grow and Nature's Own.

(ii) For the EOQ, what is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's Own ?

(iii) For the EOQ, compute the number of deliveries per year for Super Grow and Nature's Own.

Illustration 20 :

KL Limited produces product 'M' which has a quarterly demand of 8,000 units. The product requires 3 kgs quantity of material 'X' for every finished unit of product. The other information are follows :

Cost of material 'X' : ₹ 20 per kg

Cost of placing an order : ₹ 1,000 per order

Carrying cost : 15% per annum of average inventory

Required :

(i) Calculate the Economic Order Quantity for material 'X'.

(ii) Should the company accept an offer of 2 percent discount by the supplier, if he wants to supply the annual requirement of material 'X' in 4 equal quarterly instalments ?

Working Notes :

Particulars	*EOQ*		*Offer*	
a. No. of orders	96,000 / 8,000	12	Given	4
b. Cost per order		1,000		1,000
1. Total Ordering Costs (a x b)		12,000		4,000
c. Average Stock	8,000 / 2	4,000	24,000 / 2	12,000
d. Carrying Cost p.a.	15% x ₹ 20	3	15% x (20 x 98%)	2.94
2. Total Carrying Costs (c x d)		12,000		35,280

(ii) Evaluation of Cost under different options of 'order quantity'

Particulars	*Working*	*EOQ*	*Offer*
1. Total Purchases (kg.)		96,000	96,000
2. Rate per kg.		20	20
3. Purchase cost @ 20 per kg.	1 x 2	19,20,000	19,20,000
4. Less : Discount @ 2%		-	38,400
5. Net Cost of Items	3 – 4	19,20,000	18,81,600
6. Add : Order Cost	WN 1	12,000	4,000
7. Add : Carrying Cost	WN 2	12,000	35,280
8. **Total Cost (including Items Costs)**	5 + 6 + 7	**19,44,000**	**19,20,880**

Advice : The Total Cost is lower if Company accepts an offer of 2 percent discount by the supplier, when supply of the annual requirement of material 'X' is made in 4 equal instalments.

Illustration 23 : (Table Method - Different Lots)

The following details are available.

1. Inventory requirement per year 6,000 units.
2. Cost per unit (other than carrying and ordering costs), ₹ 5.
3. Carrying costs per item for one year, ₹ 1.
4. Cost of placing each order, ₹ 60.
5. Alternative order sizes (units) : 2,000; 1,200; 1,000; 600 and 200

Determine the economic order quantity.

Solution :

The EOQ is determined in the following table.

Determination of Economic Order Quantity

Particulars / LOT	*Formula*	*1*	*2*	*3*	*4*	*5*
Annual Usage	A	6,000	6,000	6,000	6,000	6,000
Order Size	Q	2,000	1,200	1,000	600	200
Ordering Cost Per Order	O	60	60	60	60	60
Carrying Cost p.u., p.a.	C	1	1	1	1	1
No. of Orders	N = A/Q	3	5	6	10	30
Total Ordering Costs	TO = N x O	180	300	360	600	1,800
Total Carrying Costs	TC = Q x 1/2 x C	1,000	600	500	300	100
Total Annual Costs	TA = TO + TC	1,180	900	**860**	900	1,900

Thus, the EOQ is 1,000 units.

Working Notes :

1. Number of orders = $\frac{\text{Demand per year}}{\text{Order size}}$
2. Average inventory = $\frac{\text{Order size}}{2}$
3. Total carrying cost = Average inventory x Carrying cost per unit
4. Total ordering cost = Number of orders x Cost per order
5. Total cost = Cost of items purchased + Total carrying and ordering costs

Note : Table Method is used when order sizes are fixed. Using formula method, we get

$$\text{E.O.Q.} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 6{,}000 \times 60}{1}} = \mathbf{849}$$

Since the lot size is fixed, we cannot order 849 units (we have to order the next lot i.e. 1,000). We have to use the Table Method to find out the EOQ.

Illustration 26 : (Quantity Discounts)

A firm is able to obtain quantity discounts on its orders of material as follows :

Price per kg (₹)	Kg
8.00	less than 250
7.90	250 and less than 500
7.80	500 and less than 1,000
7.60	1,000 and less than 2,000
7.50	2,000 and above

The annual demand for the material is 2,000 kg. Stock holding costs are 20% of material cost per annum. The delivery cost per order is ₹ 8. Minimum ordering quantity is 200.

You are required to calculate the best quantity to order. ***[CA (Inter), Modified]***

Solution :

The best quantity to order is computed by Tabular Method as :

Particulars / LOT	*Formula*	*1*	*2*	*3*	*4*	*5*
Annual Usage	A	2,000	2,000	2,000	2,000	2,000
Order Size	Q	200	250	500	1,000	2,000
Ordering Cost Per Order	O	8	8	8	8	8
Price p.u.	P	8.00	7.90	7.80	7.60	7.50
Carrying Cost p.u., p.a.	C = P x 20%	1.60	1.58	1.56	1.52	1.50
No. of Orders	N = A/Q	10	8	4	2	1
Total Ordering Costs	TO = N x O	80	64	32	16	8
Total Carrying Costs	TC = Q x 1/2 x C	160	198	390	760	1,500
Total Annual Costs	TA = TO + TC	240	262	422	776	1,508
Total Purchase Cost	TP = A x P	16,000	15,800	15,600	15,200	15,000
Total Cost	TC = TA + TP	16,240	16,062	16,022	**15,976**	16,508

Optimum Ordering Quantity 1,000 kg having least total cost of ₹ 15,976.