

## 2. MATERIAL COST

**PROBLEM NO: 1**

$$EOQ = \sqrt{\frac{2AO}{C \times i}}$$

A = Units consumed during year

O = Ordering cost per order

C = Inventory carrying cost per unit per annum

$$EOQ = \sqrt{\frac{2 \times 10,000 \times 50}{\frac{2 \times 8}{100}}} = 2,500 \text{ kg.}$$

No. of orders to be placed in a year

= Total consumption of materials per annum / EOQ

= 10,000 kg. / 2,500 kg. = 4 Orders per year

**PROBLEM NO: 2**

a)  $EOQ = \sqrt{\frac{2AO}{IC}}$

Where

A = Annual usage of material

O = Order cost per order

IC = Inventory Carrying cost per unit per annum = Rs. 20 x 20% = Rs. 4.

$$EOQ = \sqrt{\frac{2 \times 5000 \text{ units} \times \text{Rs} 16}{\text{Rs} 4}} = 200 \text{ units}$$

**Calculation of total variable cost (Excluding material purchase cost)**

Particulars	Amount (Rs.)
Order cost $\left( \frac{\text{Annual usage}}{\text{Order size}} \times \text{Order cost per Order} \right)$	$\left( \frac{5000 \text{ units}}{200 \text{ units}} \times \text{Rs} 16 \right) = 400$
Add: Inventory carrying cost $\left( \frac{1}{2} \times \text{Order Size} \times \text{IC} \right)$	$\left( \frac{1}{2} \times 200 \text{ units} \times \text{Rs} 4 \right) = 400$
<b>Total variable cost (Excluding purchase cost)</b>	<b>800</b>

b) If Incorrect price of Rs. 12.80 is used

Then

A = 5000 units

O = Rs. 16

IC = Rs. 12.80 x 20% = Rs. 2.56

$$EOQ = \sqrt{\frac{2AO}{IC}} = \sqrt{\frac{2 \times 5000 \text{ units} \times \text{Rs} 16}{\text{Rs} 2.56}} = 250 \text{ units}$$

Statement of Total Variable cost [Excluding material purchase cost]

Particulars	Amount (Rs.)
Order cost $\left[ \frac{5000 \text{ units}}{250 \text{ units}} \times \text{Rs. } 16 \right]$	320
(+) Inventory carrying cost $\left[ \frac{1}{2} \times 250 \text{ units} \times 2.56 \right]$	320
Total variable cost [excluding material purchase cost]	640

Note: In PM purchase cost of raw material is considered while calculating variable cost.

### **PROBLEM NO: 3**

#### **WORKING NOTE:1** Calculation of EOQ

$$a) \text{ EOQ} = \sqrt{\frac{2AO}{IC}}$$

Where

A = Annual usage of material = 36000 units

O = Order cost per order = Rs.25

IC = Inventory Carrying cost percent per annum = Rs. 1 x 20% = Rs. 0.2

$$\text{EOQ} = \sqrt{\frac{2 \times 36000 \text{ units} \times \text{Rs. } 25}{\text{Rs. } 0.2}} = 3000 \text{ units}$$

#### **WORKING NOTE 2:** Calculation of No of orders in EOQ & Existing inventory policy

$$\text{Order size of existing inventory policy} = \frac{36000 \text{ units}}{6 \text{ Installments}} = 6000 \text{ units}$$

$$\text{No of orders} = \frac{\text{Annual usage}}{\text{Order cost}}$$

$$\text{For EOQ} = \frac{36000}{3000} = 12 \text{ orders}$$

$$\text{For existing inventory policy} \Rightarrow \text{orders} = \frac{36000 \text{ units}}{6000 \text{ units}} = 6 \text{ orders}$$

#### **Statement showing comparative cost of material (amount in Rs)**

Particulars	EOQ	Existing policy
Purchase Cost (Annual usage x purchase price) (36000 units x RS.1)	36,000	36,000
(+) Order cost (No. of orders x cost per order)	(12 orders x 25) 300	(6 orders x 25) 150
(+) Inventory carrying cost $\left( \frac{1}{2} \times \text{Order Size} \times \text{IC} \right)$	$\left( \frac{1}{2} \times 3000 \text{ units} \times 0.2 \right)$ 300	$\left( \frac{1}{2} \times 6000 \text{ units} \times 0.2 \right)$ 600
Total cost of material	36,600	36,750

i) Total annual cost of existing Inventory policy = RS.36,750

a) Money can be saved by EOQ = Rs. 36,750 – Rs. 36,600  
= Rs. 150

**Note:** As the unit purchase cost of Rs.1 doesnot change, No need to consider while calculating total cost of inventory for the purpose of savings.

**PROBLEM NO: 4**

$$i) \text{ Calculation of EOQ} = \sqrt{\frac{2AO}{IC}}$$

Where

$$A = \text{Annual usage of material} = \frac{1,00,000 \text{ units}}{2.5 \text{ kgs}} = 40000 \text{ kgs.}$$

$$O = \text{Order cost per order} = \text{Rs.750 (370 + 380)}$$

$$IC = \text{Inventory Carrying cost per unit per annum} = [\text{Rs.12} + (0.25 \times 12 \text{ month})] = \text{Rs.15}$$

$$\text{EOQ} = \sqrt{\frac{2 \times 40000 \text{ kgs.} \times \text{Rs}750}{\text{Rs}15}} = 2000 \text{ kgs}$$

$$ii) \text{ No Of Orders} = \frac{\text{Annual usage}}{\text{order size}} = \frac{40,000 \text{ kgs}}{2000 \text{ kgs}} = 20 \text{ orders}$$

$$\text{Time gap between orders} = \frac{360 \text{ days}}{\text{No of orders}} = \frac{360 \text{ days}}{20 \text{ Orders}} = 18 \text{ Days}$$

iii) Comparative cost of material Statement (Amount in Rs.)

Particulars	EOQ	Proportionately (quarterly basis)
Order size	2000 kg.s	10000 kg.s
Purchase Cost [Annual usage x purchase price] [40,000 kgs x Rs.80]	32,00,000	32,00,000
+ Order cost [ $\frac{\text{Annual usage}}{\text{order size}} \times \text{order cost per order}$ ]	[ $\frac{40,000 \text{ kgs}}{2000 \text{ kgs}} \times \text{Rs.750}$ ] = 15000	[ $\frac{40,000 \text{ kgs}}{10,000 \text{ kgs}} \times \text{Rs.750}$ ] = 3000
+ Inventory carrying cost ( $\frac{1}{2} \times \text{Order Size} \times \text{IC}$ )	( $\frac{1}{2} \times 2000 \text{ kg.s} \times \text{Rs.15}$ ) = 15000	( $\frac{1}{2} \times 10000 \text{ kg.s} \times \text{Rs.15}$ ) = 75000
Total cost of material	<b>32,30,000</b>	<b>32,78,000</b>

Extra cost incurred on quarterly basis Rs 48000 [i.e. Rs. 3,278,000 - Rs. 3,230,000] should be asked as discount

$$\therefore \text{Discount rate} = \frac{\text{discount Amt}}{\text{Purchase cost}} \times 100$$

$$= \frac{\text{Rs.48000}}{\text{Rs.32,00,000}} \times 100 = 1.5\%$$

Copyrights Reserved  
To **MASTER MINDS**, Guntur

**PROBLEM NO: 5**

i. Calculation of Economic Order Quantity

$$\text{EOQ} = 200 \text{ units}$$

ii. Evaluation of Profitability of Different Options of Order Quantity

a) When EOQ is ordered

		Rs.
Purchase Cost	(8,000 units × Rs.400)	32,00,000
Ordering Cost	[(8,000 units/200 units) × Rs.200]	8,000
Carrying Cost	(200 units Rs.400 ½ × 20/100)	8,000
Total Cost		32,16,000

b) When Quantity Discount is accepted

		<b>Rs.</b>
Purchase Cost	(8,000 units × Rs.384)	30,72,000
Ordering Cost	[(8,000 units/4000 units) × Rs.200]	400
Carrying Cost	(4000 units × Rs.384 × ½ × 20/100)	1,53,600
Total Cost		32,26,000

Advise – The total cost of inventory is lower if EOQ is adopted. Hence, the company is advised not to accept the quantity discount.

### **PROBLEM NO: 6**

#### a) Calculation of EOQ

$$EOQ = \sqrt{\frac{2AO}{IC}}$$

A = Annual usage of material = Rs.8,000 units × 4 quarters × 3 Kgs = 96,000 Kgs

O = Order cost per order = Rs.1,000

IC = Inventory Carrying cost per unit per annum = 20 × 15% = Rs.3

$$EOQ = \sqrt{\frac{2 \times 96,000 \text{ kgs} \times \text{Rs}1,000}{\text{Rs}3}} = 8,000 \text{ Kgs}$$

#### b) Statement of comparative cost

Particulars	EOQ	Offer
Order Size	8,000 kgs	(96,000/4) 24,000 Kgs
Purchase cost (Rs.) (Annual usage × purchase price) (96,000 kgs × Rs.20) (96,000 kgs × Rs.20 × 98%)	19,20,000	18,81,600
(+) Order cost (Rs.) $\left( \frac{\text{Annual usage}}{\text{Order size}} \times \text{Order cost per order} \right)$ $\left( \frac{96,000 \text{ Kgs}}{8,000 \text{ Kgs}} \times \text{Rs}1,000 \right) \left( \frac{96,000 \text{ Kgs}}{24,000 \text{ Kgs}} \times \text{Rs}1,000 \right)$	12,000	4,000
(+) Inventory Carrying cost = $\left( \frac{1}{2} \times 24,000 \text{ kgs} \times \right) \left( \frac{1}{2} \times 8,000 \text{ kgs} \times \text{Rs}3 \right) \left( \frac{1}{2} \times 24,000 \text{ kgs} \times \text{Rs}20 \times 98\% \times 15\% \right)$	12,000	35,280
Total Cost (Rs.)	19,44,000/-	19,20,880/-

The given offer is to be "Accepted" since if we accept offer the cost will be reduced by Rs. 23,120 (Rs.19,44,000 - Rs19,20,880)

### **PROBLEM NO: 7**

#### i) Calculation of EOQ = $\sqrt{\frac{2AO}{IC}}$

Where

A = Annual usage of material = 60,000 pack × 12 months = 7,20,000 packs

O = Order cost per order = Rs.240

IC = Inventory Carrying cost per unit per annum = Rs. 228 × 10% = Rs. 22.8

$$EOQ = \sqrt{\frac{2 \times 7,20,000 \text{ packs} \times \text{Rs}240}{\text{Rs}22.8}} = 3894 \text{ paks.}$$

ii) Calculation to no of orders:-

$$\text{No of orders} = \frac{\text{Annual usage}}{\text{order size}} = \frac{7,20,000 \text{ Paks}}{3894 \text{ packs}} = 185 \text{ orders}$$

## iii) Calculation of order cost and carrying cost

Particulars	Amount (Rs)
Order Cost $\left[ \frac{\text{Annual usage}}{\text{Order size}} \times \text{order cost per order} \right] = \left[ \frac{720,000 \text{ packs}}{3894 \text{ packs}} \times 240 \right]$	44376
Inventory carrying cost $= \left( \frac{1}{2} \times \text{order size} \times \text{IC} \right) = \left[ \frac{1}{2} \times 3894 \text{ packs} \times 22.8 \right]$	44392
<b>Total</b>	<b>88768</b>

$$\text{iv) No of Packs per day} = \frac{720,000 \text{ packs}}{360 \text{ days}} = 2000 \text{ Packs per day}$$

Next order to be placed = Present stock – lead time stock

$$= 10,033 - (2000 \times 5 \text{ days})$$

$$= 33 \text{ packs}$$

∴ Next order to be placed "Immediately" (since Units Used per day = 2000 units)

**PROBLEM NO: 8**

## a) Statement showing total comparative cost of material

Particulars	Orders				
	40	50	100	200	300
a) Order size (say) (Tonnes)	40	50	100	200	300
b) Purchase price (Rs)	9600	9360	9120	8880	8640
c) No of orders = $\frac{\text{Annual usage}}{\text{Order size}} = \frac{500 \text{ kgs}}{\text{(a)}}$	13	10	5	3	2
d) Purchase cost = (Annual usage x Purchase price)(500kgs x b) (Rs.)	48,00,000	46,80,000	45,60,000	44,40,000	43,20,000
e) Order cost = (No. of orders x cost per order) (c x 12,500) (Rs.)	1,62,500	1,25,000	62,500	37,500	25,000
f) Inventory carrying cost per unit per annum = (Purchase price x 25 %) (b x 25%) (Rs.)	2,400	2,340	2,280	2,220	2,160
g) Total inventory carrying cost = $\left( \frac{1}{2} \times 24000 \text{ kgs} \times \right) = (1/2) \times a \times f$ (Rs.)	48,000	58,500	1,14,000	2,22,000	3,24,000
<b>Total cost (d + e + g) (Rs.)</b>	<b>50,10,500</b>	<b>48,63,500</b>	<b>47,36,500</b>	<b>46,99,500</b>	<b>46,69,000</b>

Since cost is least in order size of 300 kgs, it is most economic purchase level

Theoretically number of orders may be in fractional numbers

**Note:** Number of order rounded off to the nearest whole number

$$\text{b) EOQ} = \sqrt{\frac{2 \times 500 \text{ tonnes} \times \text{Rs.} 12,500}{\text{Rs.} 2,625}} = 69 \text{ Tonnes}$$

Copyrights Reserved  
To **MASTER MINDS**, Guntur

**PROBLEM NO: 9**

Statement showing total cost of materials at various levels

Order Size	45 units	50 units	100 units	200 units
a) Purchase price (Rs.)	(30 - 0%) 30	(30 - 5%) 28.5	(30 - 10%) 27	(30 - 12%) 26.4
b) Annual consumption (given units)	250	250	250	250
c) Total Purchase cost (a x b) (Rs.)	7,500	7,125	6,750	6,600
d) *No of orders = $\frac{b}{\text{Order Size}}$	6	5	3	2
e) Ordering cost per order (Rs.) given	20	20	20	20
f) Total ordering cost (Rs.) (d x e)	120	100	60	40
g) Inventory carrying cost (Rs.) $\left(\frac{1}{2} \times \text{ordersize} \times 4\right)$	90	100	200	400
<b>Total cost [c + f + g] Rs.</b>	<b>7,710</b>	<b>7,325</b>	<b>7,010</b>	<b>7,040</b>

∴ Optimal order quantity (where cost is low) = 100 units

**Calculation of EOQ at Zero quantity discounts:**

$$\therefore \text{EOQ} = \sqrt{\frac{2UO}{IC}}$$

Where U = Annual consumption

O = Ordering cost per order

IC = Inventory carrying cost p.a

$$= \sqrt{\frac{2(250\text{units}) \times \text{Rs.}20}{\text{Rs.}4}} = 50\text{units}$$

∴ Minimal total cost of inventory and purchasing cost = Rs.7,010 units (60 + 200 + 6750)

Note: → Here in the calculation of no of orders i.e.  $\frac{\text{AnnualConsumption}}{\text{OrderSize}}$ , for 45 units, no of orders are actually 5.5 order size.

But, in practical we have 5 or 6 orders but not 5.5 orders. So such fractions are adjusted to the closing numbers.

**PROBLEM NO: 10**

a) Re-ordering level = Maximum consumption x Maximum reorder period

$$\therefore \text{Re-ordering level of A} = 75 \text{ Kg} \times 6 \text{ Weeks} = 450\text{Kg}$$

$$\text{Re-ordering level of B} = 75 \text{ Kg} \times 4 \text{ Weeks} = 300\text{Kg}$$

b) Minimum consumption level = Re-order level – (Avg Consumption x Avg reorder period)

$$\text{Minimum consumption level for A} = 450 \text{ Kg} - (50 \text{ Kg} \times 5\text{weeks})$$

$$= 450 \text{ Kg} - 250 \text{ kg}$$

$$= 200 \text{ Kg}$$

$$\text{Minimum consumption level for B} = 300 \text{ Kg} - (50 \text{ Kg} \times 3 \text{ weeks})$$

$$= 150 \text{ Kg}$$

c) Maximum stock level = Reorder level + reorder quantity – (Minimum consumption x minimum Reorder period)

$$\text{Maximum stock level for A} = 450 \text{ Kg} + 300 \text{ Kg} - (25 \text{ Kg} \times 4 \text{ weeks})$$

$$\begin{aligned}
 &= 750 \text{ Kg} - 100\text{kg} \\
 &= 650 \text{ Kg} \\
 \text{Maximum stock level for B} &= 300 \text{ Kg} + 500 \text{ Kg} - (25 \text{ Kg} \times 2 \text{ weeks}) \\
 &= 800 \text{ Kg} - 50 \text{ Kg} \\
 &= 750 \text{ Kg}
 \end{aligned}$$

d) Average stock level =  $\frac{\text{Minimum stock level} + \text{Maximum stock level}}{2}$

$$\text{Average stock level of A} = \frac{200\text{Kg} + 650\text{Kg}}{2} = 425 \text{ Kg}$$

$$\text{Average stock level of B} = \frac{150\text{Kg} + 750\text{Kg}}{2} = 450 \text{ Kg}$$

### **PROBLEM NO: 11**

a) Re order quantity = Economic order quantity =  $\sqrt{\frac{2AO}{IC}}$

Where A = Annual consumption = 7,500 units x 12 months = 90,000 units

O = Ordering cost per order = Rs.500

IC = Inventory carrying cost p.a. = Rs.60 x 10% = Rs.6

$$\therefore \text{Re-order quantity} = \sqrt{\frac{2(90,000) \times \text{Rs.}500}{\text{Rs.}6}} = 3,873 \text{ units (Approx.)}$$

b) Re-order level = Maximum consumption x Maximum re-order period  
 = 75 units x 8 weeks  
 = 6,000 units

c) Minimum stock level = Re-order level - (Avg consumption x Avg Re-order period)  
 = 6,000 units - (500 units x  $\frac{5+8}{2}$  weeks)  
 = 6,000 units - 3,250 units = 2,750 units

d) Maximum stock level = (Reorder level + reorder quantity) - (Minimum consumption x minimum Reorder period)  
 = 6,000 units + 3,873 units - (250 units x 5 weeks)  
 = 9,873 units - (1,250 units) = 8,623 units

e) Average stock level =  $\frac{\text{Minimum stock level} + \text{Maximum stock level}}{2}$   
 =  $\frac{2,750 \text{ units} + 8,623 \text{ units}}{2}$   
 = 5,687 units

### **PROBLEM NO: 12**

a) Economic order quantity =  $\sqrt{\frac{2AO}{IC}}$

Where A = Annual consumption = 36,000 litres

O = Ordering cost per order = Rs.35,000/-

$$\begin{aligned} \text{IC} = \text{Inventory carrying cost p.a.} &= (\text{Rs.}900+10\%) \times (1.5\%+0.2676\%) \\ &= (\text{Rs.}900+10\%) \times 1.7676\% \\ &= \text{Rs. } 17.5 \end{aligned}$$

$$\therefore \text{EOQ} = \sqrt{\frac{2(36,000) \times \text{Rs.}35,000}{\text{Rs.}17.5}} = 12,000 \text{ litres}$$

b) Re-order point = lead time consumption + safety stock

$$\text{Safety stock} = \frac{\text{Annual demand}}{360 \text{ days}} \times \left( \begin{array}{cc} \text{Max.} & \text{Avg.} \\ \text{leadtime} & \text{leadtime} \end{array} \right)$$

$$\begin{aligned} \therefore \text{Safety stock at 10\% risk} &= (14 \text{ days} - 12 \text{ days}) \times \frac{36000 \text{ units}}{360 \text{ days}} \\ &= 200 \text{ litres} \end{aligned}$$

$$\text{Lead time consumption} = 12 \text{ days} \left( \frac{36000 \text{ units}}{360 \text{ days}} \right) = 1200 \text{ litres}$$

$$\therefore \text{Re-order point} = 1200 \text{ litres} + 200 \text{ litres} = 1400 \text{ litres}$$

c) Safety stock at 5% risk = (15 days – 12 days) x  $\frac{36000 \text{ units}}{360 \text{ days}}$  = 300 litres

**Statement showing total ordering & carrying cost at 5% risk**

Particulars	Amount (Rs.)
i. Ordering cost $\left( \frac{36000 \text{ litres}}{12000 \text{ litres}} \times \text{Rs.}35,000 \right)$	1,05,000
ii. Carrying cost $\left[ \left( 300 \text{ litres} + \frac{1}{2} \times 12,000 \text{ litres} \right) \times \text{Rs.}17.5 \right]$	1,10,250
<b>Total cost</b>	<b>2,15,250</b>

**Note:** Here Carrying cost =  $\left( (\text{safety stock at 5\% risk}) + \left[ \frac{1}{2} \times \text{EOQ} \right] \right) \times \text{IC}$

### **PROBLEM NO: 13**

a) Economic order quantity =  $\sqrt{\frac{2AO}{\text{IC}}}$

Where A = Annual consumption = 6,250 units x 4 = 25,000 units

O = Ordering cost per order = Rs.45/-

IC = Inventory carrying cost per unit p.a. = Rs.2.4 x 15% = Rs.0.36

$$\therefore \text{EOQ} = \sqrt{\frac{2(25,000) \times \text{Rs.}45}{\text{Rs.}0.36}} = 2,500 \text{ units}$$

b) **Statement showing total Annual cost at EOQ & existing policy**

Particulars	EOQ (2,500 units)	Proposed (6,250 units)
Total Ordering cost $\left( \frac{25,000 \text{ units}}{25,00 \text{ units}, 6,250 \text{ units}} \times \text{Rs.}45 \right)$	450	180
Inventory carrying cost $\left( \frac{1}{2} \times \text{Rs.}0.36 \times 2500 \text{ units}, 6,250 \text{ units} \right)$	450	1,125
<b>Total cost</b>	<b>900</b>	<b>1305</b>

c) Amount that can be saved by choosing EOQ rather than proposed units = Rs1,305 – Rs.900  
= Rs.405

d) Given that no of days = 250,

e) Re-order point = ?

Re-order period = 10 days,

Safety stock = 500 units

∴ Re-order point = lead time consumption + safety stock

$$= \left( \frac{25000 \text{ units}}{250 \text{ days}} \times 10 \text{ days} \right) + 500 \text{ units}$$

$$= 1,000 \text{ units} + 500 \text{ units}$$

$$= 1,500 \text{ units}$$

Maximum level = EOQ + Safety stock

$$= 2500 \text{ units} + 500 \text{ units}$$

$$= 3000 \text{ units}$$

Minimum stock level = Re-order level – (Avg consumption x Avg Re-order period)

$$= 1500 \text{ units} - \left( \frac{25000 \text{ units}}{250 \text{ days}} \times 10 \text{ days} \right)$$

$$= 1500 \text{ units} - 1000 \text{ units}$$

$$= 500 \text{ units}$$

Average stock level =  $\frac{\text{Minimum stock level} + \text{Maximum stock level}}{2}$

$$= \left( \frac{3000 \text{ units} + 500 \text{ units}}{2} \right)$$

$$= 1750 \text{ units}$$

Note: Minimum stock level = Safety stock

### **PROBLEM NO: 14**

Inventory turnover ratio =  $\frac{\text{cost of goods sold}}{\text{Average Stock}}$

Inventory turnover ratio of A =  $\frac{10000 + 52000 - 6000}{\left( \frac{10000 + 6000}{2} \right)} = \frac{\text{Rs.56,000}}{\text{Rs.8,000}} = 7 \text{ times}$

Inventory turnover ratio of B =  $\frac{9000 + 27000 - 11000}{\left( \frac{11000 + 9000}{2} \right)} = \frac{\text{Rs.25,000}}{\text{Rs.10,000}} = 2.5 \text{ times}$

**Note:** COGS = Opening stock + purchases – closing stock

Average stock =  $\frac{\text{Opening stock} + \text{Closing stock}}{2}$

Comment: Material A is faster moving than Material B

### **PROBLEM NO: 15**

Calculation of total cost of materials

Particulars	Amount (Rs.)
Purchase value of 200 units @ Rs.5 each	1000
Less: discount of 20%	(200)
Net purchase price	<b>800</b>
Add: packing charges	50
	<b>850</b>

Total No. of Units = 200 units

$$\therefore \text{cost per unit} = \frac{\text{Net purchase price}}{\text{No of units}} = \frac{\text{Rs.850}}{200 \text{ units}} = \text{Rs.4.25 per unit}$$

### **PROBLEM NO:16**

Statement showing computation of effective quantity of each chemical available for use

Particulars	Chemical A (Kg)	Chemical B (Kg)	Chemical C (Kg)
Quantity purchased	3,000	5,000	2,000
Less: Shortage due to breakage	(200)	(280)	(100)
	<b>2,800</b>	<b>4,720</b>	<b>1,900</b>
Less: Provision for further deterioration 5%	(140)	(236)	(95)
	<b>2,660</b>	<b>4,484</b>	<b>1,805</b>

Statement showing total cost of material

Particulars	Chemical A (Rs.)	Chemical B (Rs.)	Chemical C (Rs.)
Purchase price	12,600	19,000	9,500
Add: Sales Tax*	630	950	475
Railway Freight*	300	500	200
Octroi duty @ 0.1 kg	300	500	200
cartage paid	22	63.12	31.8
	<b>13,852</b>	<b>21,013.12</b>	<b>10,406.8</b>

Rate per Kg.

$$\text{Chemical A} = \frac{\text{Rs.13,852}}{2660 \text{ kgs}} = \text{Rs.5.2}$$

$$\text{Chemical B} = \frac{\text{Rs.21,013.20}}{4484 \text{ kgs}} = \text{Rs. 4.6}$$

$$\text{Chemical C} = \frac{\text{Rs.10,406.80}}{1805 \text{ kgs}} = \text{Rs. 5.7}$$

Copyrights Reserved  
To **MASTER MINDS**, Guntur

\*Sales tax is apportioned on the basis of purchase price

\* Railway freight is apportioned in the ratio of quantity purchased

### **PROBLEM NO: 17**

Working Notes

Date	Particulars	Qty. (kgs)	Rate (Rs.)	Value (Rs.)
01.03.2013	Opening Stock (A)	22,000	58.50	12,87,000
03.03.2013	Purchase	35,000	60.75*	21,26,250

18.03.2013	Purchase		32,000	61.25*	19,60,000
25.03.2013	Purchase		22,000	61.75*	13,58,500
	Total Purchase	(B)	89,000		54,44,750
	Total (A+B)	(C)	1,11,000		67,31,750
31.03.2013	Closing Stock	(D)	23,000		
	Quantity issued during March, 13	(C - D)	88,000		53,12,000#

\* Cost of purchase includes freight paid @ RS.1.75 per kgs

# Value of material issued under FIFO method

Quantity (kgs)	Rate (RS.)	Value (RS.)
22,000	58.50	12,87,000
35,000	60.75	21,26,250
31,000	61.25	18,98,750
88,000		53,12,000

(i) Value of Closing Stock as on 31.03.2013 using FIFO method

	(Rs.)
Value of Opening Stock	12,87,000
Add: Purchases made	<u>54,44,750</u>
	67,31,750
Less: Value of material issued	<u>(53,12,000)</u>
Value of Closing Stock	<u>14,19,750</u>

(ii) Cost of Goods Sold

Cost of materials issued = 53,12,000

(iii) Profit for the month of March, 2013

	(Rs.)
Value of Material issued	53,12,000
Add: Accountant's Salary	<u>11,000</u>
Total Cost	53,23,000
Less: Sales Value	<u>(62,00,000)</u>
Profit	<u>8,77,000</u>

**PROBLEM NO: 18**  
Store Ledger Account

Name - Code No. - Description-			Max. Stock Level - Min. Stock Level - Re-order level -			Bin No.- Location Code- Re-order quantity-			
Date	Receipts			Issues			Balance		
	Qty. Units	Rate (Rs.)	Amount (Rs.)	Qty. Units	Rate (Rs.)	Amount (Rs.)	Qty. Units	Rate (Rs.)	Amount (Rs.)
April 1							200	10	2,000
April 5	250	8	2000				200	10	4,000
							250	8	
April 8	150	8.50	1275				200	10	5,275
							250	8	
							150	8.50	
April 10				100	8.50	850	200	10	4,425
							250	8	
							50	8.50	
April 15	50	10	500				200	10	4,925

							250	8	
							50	8.50	
							50	10	
April 20				10 (shortage)	10	100	190	10	4,825
							250	8	
							50	8.50	
							50	10	
April 21	60	9	540				190	10	5,365
							250	8	
							50	8.50	
							50	10	
							60	9	
April 22				190	10	3,580	40	8	1,785
				210	8		50	8.50	(closing Stock)
							50	10	
							60	9	

### **PROBLEM NO:19**

- a) The Closing Stock at the end of six months' period i.e., on 30th June, 20X1 will be 200 units, whereas up to the end of May 20X1, total purchases coincide with the total issues i.e., 1,900 units. It means that at the end of May 20X1, there was no closing stock. In the month of June 20X1, 600 units were purchased out of which 400 units were issued. Since there was only one purchase and one issue in the month of June, 20X1 and there was no opening stock on 1st June 20X1, the Closing Stock of 200 units is to be valued at ' 20 per unit. In view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the Chief Accountant that the value of Closing Stock remains the same no matter which method of pricing the issue is used. It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.
- b) LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:
- The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues
  - The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first-out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.
  - In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.
  - During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

### **PROBLEM NO: 20**

Classification of the items of inventory as per ABC analysis

- 15 number of varieties of inventory items should be classified as 'A' category items because of the following reasons:
  - Constitute 0.375% of total number of varieties of inventory handled by stores of factory, which is minimum as per given classification in the table.
  - 50% of total use value of inventory holding (average) which is maximum according to the given table.

- iii) Highest in consumption about 85% of inventory usage (in end-product).
2. 110 number of varieties of inventory items should be classified as 'B' category items because of the following reasons:
- Constitute 2.750% of total number of varieties of inventory items handled by stores of factory.
  - Requires moderate investment of about 30% of total use value of inventory holding (average).
  - Moderate in consumption about 10% of inventory usage (in end-product).
3. 3,875 number of varieties of inventory items should be classified as 'C' category items because of the following reasons:
- Constitute 96.875% of total varieties of inventory items handled by stores of factory.
  - Requires about 20% of total use value of inventory holding (average).
  - Minimum inventory consumption i.e. about 5% of inventory usage (in endproduct).

**PROBLEM NO: 21****Calculation of Economic Order Quantity**

Average Inventory = Total Carrying Cost / Carrying Cost per unit  
 = Rs. 9,000 / Rs.3.60 = 2,500 Units.

Economic Order Quantity = Average Inventory × 2 = 2,500 units × 2 = 5,000 units.

**PROBLEM NO: 22**

Maximum Level = Re-order level + Re-order Quantity - (Min. usage × Min. Re-order Period)

Re-order Level = Maximum Level - [Re-order Quantity - (Min. usage × Min. Re-order Period)]  
 = 8,000 kg. - [5,000 kg. - (400 kg\* × 4 days)] = 8,000 kg. - 3,400 kg. = 4,600 kg.

Hence, Re-order level is 4,600 kg.

\*Minimum usage per day = 50 kg. × 8 hours = 400 kg.

**PROBLEM NO: 23**

(i) Reorder Quantity (ROQ) = 1,100 units (Refer to working note)

(ii) Reorder level (ROL) = Lead time consumption + Safety stock  
 = 500 units + 1,000 units.  
 = 1,500 units.

(iii) the inventory level (ideally) immediately before the material order is received be the safety stock is 1,500 units

**Working Note**

i) Annual consumption of raw material (A) = 12,000 units

Cost of placing an order (O) = Rs.1

Carrying cost per kg. Per annum (c × i) = Rs.1 × 24% = Rs.0.24

Economic order quantity (EOQ) =  $\sqrt{\frac{2AO}{C \times i}} = \sqrt{\frac{2 \times 12,000 \times 1}{Rs.0.24}} = 1,100$  units. (Approx)

ii) Lead time consumption = Annual consumption / no. of days in a year × Normal lead time  
 = 12,000 units / 360 × 15 days  
 = 500 units.

iii) Safety stock = Annual consumption / no. of days in a year × 30 days  
 = 12,000 units / 360 × 30 days  
 = 1,000 units

**THE END**