2. MATERIALS

PROBLEM NO: 1

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

Where

A = Annual usage of material = 4000 units x 12 months = 48000 units

O = Order cost per order = Rs. 120 per order

IC = Inventory Carrying cost = Rs. 20 x 10% = Rs. 2.

$$EOQ = \sqrt{\frac{2AO}{IC}} = \sqrt{\frac{2 \times 48000\,units \times Rs.120}{Rs.2}} = 2400\,units$$

b) Statement showing comparative cost of material (Amount in Rs.)

Particulars	EOQ	Proportionate
Order size	2400 units	4000 units
(a) Purchase cost (Annual usage x purchase price)	9,60,000 [48000 x 20]	9,60,000 [48000 units x 20]
Add: (b) Order cost $\left[\frac{Annual\,usage}{order\,size} \times order\,cost\,per\,order\right]$	2400 $\left[\frac{48000\,Units}{2400\,unis} \times Rs.120\right]$	1440 $\left[\frac{48000\,Units}{4000\,unis} \times Rs.120\right]$
(c) Inventory carrying cost [1/2 x order size x Inventory carrying cost per unit per annum]	*2400 $\left[\frac{1}{2} \times 2400\,units \times 2Rs\right]$	4000 $\left[\frac{1}{2} \times 4000\,units \times 2Rs\right]$
Total material cost	9,64,800	965440

c) Extra Cost Incurred If lot size is 4000 Units = Rs.965440 – Rs.964800 = Rs.640

d) *The minimum carrying cost the company has to incur = Rs.2,400/-

Note: As the purchase price is constant, so no need to consider it while preparing of statement of comparative cost of material.

PROBLEM NO: 2

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

Where

A = Annual usage of material = 5000 units

O = Order cost per order = Rs.16

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

$$EOQ = \sqrt{\frac{2 \times 5000\,units \times Rs16}{Rs\,4}} = 200\,units$$

Calculation of total variable cost (Excluding material purchase cost)

Particulars	Amount (Rs.)
Order cost $\left(\frac{Annual\,usage}{Order\,size} \times Order\,cost\,per\,Order\right)$	$\left(\frac{5000\,units}{200units} \times Rs16\right) = 400$
Add: Inventory carrying cost $\left(\frac{1}{2} \times Order\,Size \times IC\right)$	$\left(\frac{1}{2} \times 200\,units \times Rs.4\right) = 400$
Total variable cost (Excluding purchase cost)	**800**

b) If Incorrect price of Rs. 12.80 is 4 used

Then

A = 5000 units

O = Rs. 16

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

$$EOQ = \sqrt{\frac{2AO}{IC}} = \sqrt{\frac{2x5000\,units\,xRs.16}{Rs.2.56}} = 250\,units$$

Statement of Total Variable cost [Excluding material purchase cost]

Particulars	Amount (Rs.)
Order cost $\left[\frac{5000\,units}{250\,units} X Rs.16\right]$	320
(+) Inventory carrying cost $\left[\frac{1}{2} x 250\,units\,x\,2.56\right]$	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) $EOQ = \sqrt{\frac{2AO}{IC}}$

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

$$EOQ = \sqrt{\frac{2\,x\,36000\,units\,x\,Rs\,25}{Rs\,0.2}} = 3000\ units$$

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

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

No of orders = $\frac{Annualusage}{Ordercost}$

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

For existing inventory policy => orders = $\frac{36000\,units}{6000\,units}$ = 6 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 $\left(\frac{1}{2}\text{x Order Size x IC}\right)$	$\left(\frac{1}{2}\text{x3000 units x0.2}\right)$ 300	$\left(\frac{1}{2}\text{x6000 units x0.2}\right)$ 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) Calculation of EOQ = $\sqrt{\frac{2AO}{IC}}$

Where

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

O = Order cost per order = Rs.750 (370 + 380)

IC = Inventory Carrying cost per unit per annum = $[\text{Rs.12} + (0.25\text{x12 month})] = \text{Rs.15}$

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

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

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 $\left[\frac{\text{Annual a usage}}{\text{order size}}\text{x order cost per order}\right]$	$\left[\frac{40{,}000\text{kgs}}{2000\text{kgs}}\text{x Rs.750}\right]$ = 15000	$\left[\frac{40{,}000\text{kgs}}{10{,}000\text{kgs}}\text{x Rs.750}\right]$ = 3000
+ Inventory carrying cost $\left(\frac{1}{2}\text{x Order Size x IC}\right)$	$\left(\frac{1}{2}\text{x 2000 kg.s x Rs.15}\right)$=15000	$\left(\frac{1}{2}\text{x 10000 kg.s x Rs.15}\right)$ = 75000
Total cost of material	**32,30,000**	**32,78,000**

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

$\therefore$ Discount rate $= \frac{\text{discount Amt}}{\text{Purchase cost}}\text{x100}$

$= \frac{\text{Rs. 48000}}{\text{Rs. 32,00,000}}\text{x100} = 1.5\%$

PROBLEM NO: 5

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

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

O = Order cost per order = Rs.240

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

$$EOQ = \sqrt{\frac{2 \times 7,20,000\,packs \times Rs\,240}{Rs22.8}} = 3894 \text{ paks.}$$

ii) **Calculation to no of orders:-**

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

iii) Calculation of order cost and carrying cost

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

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

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

= 10,033 – (2000 x 5days)

= 33 packs

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

PROBLEM NO: 6

Given

Annual usage = 30,000 units x 4 quarters x 1.5 kgs=1,80,000 kgs

Order cost = Rs. 1000 per order

Inventory carrying cost per unit per Annum = Rs. 2 (IC)

Lead time = 24 days

Safety stock = 8000 units.

a) Reorder point = Lead Time stock + safety stock

$$= \left[\frac{180,000\,kgs}{360days} \times 24days\right] + 8000kgs = 20,000\ kgs$$

b) Statement showing comparative cost

Particulars	1 order	2 orders	4 orders	6 orders
Order size = $\frac{\text{Annual Usage}}{\text{No of orders}}$	180,000 kgs	90,000 kgs	45000 kgs	3,000 kgs
Order cost (No of orders x order cost (Rs.)	1000 (1 order x Rs. 1000)	2000 [2 orders x Rs. 1000]	4000 [4 order x Rs. 1000]	6000 [Rs. 1000 x 6 order]
(+) Inventory carrying cost	1,80,000	90,000	45,000	30,000

1/2 x OS x IC] (Rs.)	[1/2 x 1,80,000kgs x Rs.2]	[1/2 x 90,000kgs x Rs.2]	[1/2 x 45,000kgs x Rs.2]	[1/2 x 30,000kgs x Rs.2]
(-) Discount (Given) (Rs.)	(32000)	(20,000)	(Nil)	(Nil)
Net material cost	1,49,000	72000	49000	36000

c) Calculation No of orders to be placed to Minimise cost

$$\text{No of orders} = \frac{\text{Annual Usage}}{\text{EOQ (working note 1)}} = \frac{1{,}80{,}000\,\text{kgs}}{13{,}416\,\text{Kgs}} = 13.4168 \text{ orders} \simeq 14 \text{ orders}$$

WORKING NOTE 1: Calculation of EOQ

$$\text{EOQ} = \sqrt{\frac{2AO}{IC}} = \sqrt{\frac{2 \times 1{,}80{,}000\,\text{kgs} \times \text{Rs}1{,}000}{\text{Rs}.2}} = 13{,}416 \text{ Kgs}$$

A = Annual usage of material = 1,80,000 Kgs

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

IC = Inventory Carrying cost per unit per annum = Rs.2

WORKING NOTE 2:

At EOQ = 13,416 kgs

Total ordering & Carrying cost

$= \sqrt{2AOC}$

$= \sqrt{2 \times 1{,}80{,}000\,\text{kgs} \times \text{Rs}.1{,}000 \times \text{Rs}.2}$

= Rs.26833 (Approx.)

Discount = Nil

Since at EOQ total ordering & carrying cost is minimum

PROBLEM NO: 7

a) Calculation of EOQ

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

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

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

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

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

b) Statement of comparative cost

Particulars	EOQ	Offer
Order Size	8,000 kgs	(96,000/4) 24,000 Kgs
Purchase cost (Rs.) (Annual usage x purchase price) (96,000 kgs x Rs.20) (96,000 kgs x Rs.20 x 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 = $\left(\frac{1}{2}\text{x}24000\,\text{kgs x}\right)\left(\frac{1}{2}\text{x}8000\,\text{kgs x Rs.3}\right)\left(\frac{1}{2}\text{x}24{,}000\,\text{kgs x Rs.20 x 98\% x 15\%}\right)$	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: 8

a) Statement showing total comparative cost of material

Particulars	Orders				
a) Order size (say) (Tonnes)	40	50	100	200	300
b) Purchase price (Rs)	9,600	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 = $\left(\frac{1}{2}\text{x}24000\,\text{kgs x}\right)$ = (1/2) x a x f (Rs.)	48,000	58,500	1,14,000	2,22,000	3,24,000
Total cost (d + e + g) (Rs.)	**50,10,500**	**48,63,500**	**47,36,500**	**46,99,500**	**46,69,000**

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

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

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 = $\frac{\text{b}}{\text{Order Size}}$	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.) $\left(\frac{1}{2}\text{x ordersize x 4}\right)$	90	100	200	400
Total cost [c + f + g] Rs.	**7,710**	**7,325**	**7,010**	**7,040**

∴ 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. $\frac{\text{Annual Consumption}}{\text{Order Size}}$, 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

∴ Re-ordering level of A = 75 Kg x 6 Weeks = 450Kg

Re-ordering level of B = 75 Kg x 4 Weeks = 300Kg

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

Minimum consumption level for A = 450 Kg – (50 Kg x 5weeks)

= 450 Kg – 250 kg

= 200 kg

Minimum consumption level for B = 300 Kg – (50 Kg x 3 weeks)

= 150 Kg

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

Maximum stock level for A = 450 Kg + 300 Kg – (25 Kg x 4 weeks)

= 750 Kg – 100kg

= 650 Kg

Maximum stock level for B = 300 Kg + 500 Kg – (25 Kg x 2 weeks)

= 800 Kg – 50 Kg

= 750 Kg

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

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

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

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

IC = Inventory carrying cost p.a. = (Rs.900+10%) x (1.5%+0.2676%)

= (Rs.900+10%) x 1.7676%

= Rs. 17.5

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

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

Safety stock = $\frac{\text{Annual demand}}{360\,\text{days}} \times \left(\begin{matrix}\text{Max.} \\ \text{lead time}\end{matrix} \quad \begin{matrix}\text{Avg.} \\ \text{lead time}\end{matrix}\right)$

$\therefore$ Safety stock at 10% risk = (14days – 12days) x $\frac{36000\,\text{units}}{360\,\text{days}}$

= 200 litres

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

∴ Re-order point = 1200 litres + 200 litres = 1400 litres

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

Statement showing total ordering & carrying cost at 5% risk

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

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

PROBLEM NO: 13

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

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

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

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

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

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

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

= 1,000 units + 500 units

= 1,500 units

Maximum level = EOQ + Safety stock

= 2500 units + 500 units

= 3000 units

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

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

= 1500 units – 1000 units

= 500units

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

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

= 1750 units

Note: Minimum stock level = Safety stock

PROBLEM NO: 14

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

$$\text{Inventory turnover ratio of A} = \frac{10000 + 52000 - 8000}{\left(\frac{10000 + 6000}{2}\right)} = \frac{\text{Rs.56,000}}{\text{Rs.8,000}} = 7 \text{ times}$$

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

Note: COGS = Opening stock +purchases – closing stock

$$\text{Average stock} = \frac{\text{Openingstock} + \text{Closingstock}}{2}$$

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	**800**
Add: packing charges	50
	850

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)
	2,800	**4,720**	**1,900**
Less: Provision for further deterioration 5%	(140)	(236)	(95)
	2,660	**4,484**	**1,805**

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
	13,852	**21,013.12**	**10,406.8**

Rate per Kg.

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

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

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

*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	54,44,750
	67,31,750
Less: Value of material issued	(53,12,000)
Value of Closing Stock	14,19,750

(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	11,000
Total Cost	53,23,000
Less: Sales Value	(62,00,000)
Profit	8,77,000

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
							50	10	Stock)
							60	9	

PROBLEM NO:19

Store Ledger of Aditya Ltd. (Weighted Average Method)

Date	Receipts			Issues			Balance of Stock		
Feb	Qty (kg.)	Rate (Rs.)	Amount (Rs.)	Qty (kg.)	Rate (Rs.)	Amount (Rs.)	Qty (kg.)	Rate (Rs.)	Amount (Rs.)
1	-	-	-	-	-	-	1200	475.00	5,70,000
5	-	-	-	975	475.00	4,63,125	225	475.00	1,06,875
6	3,500	460.00	16,10,000	-	-	-	3,725	460.91	17,16,875
7	-	-	-	2,400	460.91	11,06,175	1,325	460.91	6,10,700
9	475	460.91	2,18,932	-	-	-	1,800	460.91	8,29,632
15	1,800	480.00	8,64,000	-	-	-	3,600	470.45	16,93,632
17	-	-	-	140	480.00	67,200	3,460	470.07	16,26,432
20	-	-	-	1,900	470.07	8,93,133	1,560	470.06	7,33,299
28	-	-	-	180*	470.06	84,611	1,380	470.06	6,48,688

* 180 kgs. is abnormal loss, hence it will be transferred to Costing Profit & Loss A/c.

PROBLEM NO: 20

a) Gross quantity of input material required to be procured.

Output required	-	4,800 tonne
Add: Scrap: A: (4,800×5%)	-	240 tonne
B: (4,800×10%)	-	480 tonne
Total input required	-	5,520 tonne

b) Selection of supplier:

Particulars	X (Rs.)	Y (Rs.)	Z (Rs.)
Invoice price	60,000	55,000	65,000
Less: Discount @ 5%	-	-	(3,250)
	60,000	55,500	61,750
Add: Freight charges	2,000	3,000	Nil
Cost per tone	62,000	58,000	61,750

Option- I: Purchase the raw material from Y subject to his capacity of 4000 tonnes and purchase the balance from X

$\therefore$ Cost per tonne $= \frac{4,000 \times 58,000 + 1,520 \times 62,000}{5,520}$ = Rs.59,101 per tonne.

Option - II: Purchase the total raw material in total from Z @ Rs. 61,750 per tonne.

Decision: Option-I is to be selected.

Note: Income resulting from scrap is to be ignored, since the same is common for all options.

THE END