

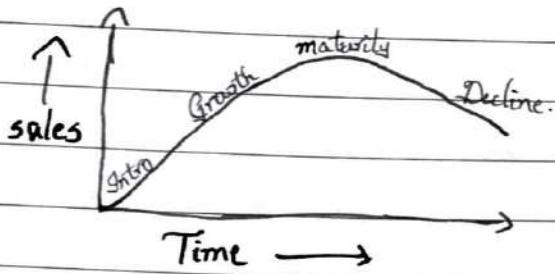
Important chapters list.

ABC (activity based costing)	10 M
Just in time purchase	4 M
Total quality management	5 M
Decision making techniques (marginal costing, transfer pricing, pricing decisions, PLC costing)	26 M ***
Standard costing	15 M

Operation Management

Network analysis	10 M
Transportation	6 M
Simulation	8 M
Linear programming	5 M
Learning curve	5 M
Assignment	6 M
Business forecasting models	5 M
Others...	

either or.

Introduction:

The product is new in the market and has to be ~~fixed~~ focused on advertising and marketing extensively, meanwhile the sales are lowest.

Growth:

In the growth period; the market knows about the product and sales begin to rise.

Maturity:

In this stage, the distribution channels are saturated with the product. The Marketing budget is therefore minimum.

Decline:

Eventually, the product sales fall under the impact of a new product competition, at this point, the company has to decide how the product will be discontinued.

Example - 1 :-

P & G International Ltd (P&G) has developed a new product 'K' which is about to launched into the market and it anticipates to sell 80,000 of these units at a sales price of ₹ 300 over product's life cycle of four years.

→ Data pertaining to the product 'K' are as follows.

Cost of design and development of Molds, dies and other tools	₹ 8,25,000
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Manufacturing cost.	₹ 125 per unit.
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Selling costs.	₹ 12,500 per year + ₹ 100 per unit
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Administration costs	₹ 50,000 per year.
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Warranty expenses	5 replacement parts per 25 units at ₹ 10 per unit; 1 whit per 600 units cost ₹ 500 per visit.
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Required :

- Compute the product 'k' in life cycle cost.
- Supper PCIL can increase sales volume by 25%. Through reduction in selling price should PCIL choose the lowest price.

Ans :-

- Computation of life cycle cost of 'k'.

Particulars.

Amount (₹).

Design and development.

825,000

Manufacturing cost

1,00,00,000

$$\{80,000 \times 2 \text{ years}\}$$

Selling cost {12,500 per year + ₹100 per unit}

$$\{12,500 \times 4 + 80,000 \times 100\} = 50,000 + 80,00,000$$

80,50,000

Administration cost.

2,00,000.

$$\{50,000 \times 4 \text{ years}\}.$$

Warranty expense.

2,40,000

$$\frac{\{80,000 \times 5 \times 10\}}{25} = 1,60,000.$$

$$\frac{\{80,000 \times 1 \times 500\}}{500} = 80,000.$$

Total cost.

93,15,000.

∴ The life cycle cost of product 'k' is ₹ 1,93,15,000.

Case - ii. * Sales volume increased by 25%.

current sales = 80,000.

increase sales = $80,000 + 25\% = 1,00,000$ units.

* Selling price is reduced by 10%.

current selling price = ₹300

Decreased price = $300 - 10\% = 270$ /unit.

(i) Computation of life cycle cost of product 'k'.

Particulars.

Amount (₹).

Design and development.	8,25,000.
Manufacturing costs ($80,000 \times 125$).	1,00,00,000
Selling costs $[12,500 \times 4] + [100 \times 80,000]$	80,50,000.
Administration costs $[50,000 \times 4 \text{ years}]$	2,00,000.
Warranty expenses.	$1,60,000 + 80,000$.

$$\left[\frac{80,000}{25} \times 5 \times ₹10 \right]$$

$$\left[\frac{80,000}{500} \times ₹500 \right]$$

life cycle cost of product 'k'

1,93,15,000

ii. Life cycle cost of product 'k' (1,00,000 units).

Particulars

Amount (₹)

Cost of design & development of molds

8,25,000.

Manufacturing costs $[1,00,000 \times 125]$

1,25,00,000.

Selling costs $[12,500 \times 4] + [1,00,000 \times 100]$

1,00,50,000.

Administration costs $[50,000 \times 4]$

2,00,000.

Warranty expenses $\left[\frac{1,00,000}{25} \times 5 \times ₹10 \right]$

$2,00,000 + 1,00,000$.

$$\left[\frac{1,00,000}{500} \times ₹500 \right]$$

Life cycle cost of product 'k'

2,38,75,000

Sales of product 'k' $[1,00,000 \times 270]$

2,70,00,000

\Rightarrow Life cycle cost of product 'k'

(2,38,75,000)

Profit of product 'k'

31,25,000

Conclusions :- No, PGI L don't choose the lower price because lower price, profit is lower, than profit at existing price.

Example - 02.

y-connections, china based firm, has just developed ultra-tablet S-5 with few features like the ability to open two apps at the same time. This tablet cost ₹ 5,00,000 to develop; it has undergone extensive research and is ready for production. Currently, the firm is deciding on plant capacity, which could cost either ₹ 35,00,000 or ₹ 52,00,000. The additional outlay would allow the plant to increase capacity from 500 units to 750 units. The relevant data for the life cycle of the tablet at different capacity level are as under:

Expected sales	500 units	750 units
Sales price	₹ 79,600 per unit.	₹ 69,600 per unit
Variable selling costs	10% of selling price	10% of selling price
Salvage value - plant	₹ 6,25,000	₹ 9,00,000.
Profit volume ratio	40%.	

Required :

Advise Y-connections, regarding the 'optimal plant capacity' to install. The tablet's life cycle is two years.

Note :

Ignore time value of money.

Sol: Statement showing "variable manufacturing cost per unit".

Particulars of costs	₹ 1 unit.
Sales	79,600.
(-) contribution (40%)	31,840
variable cost.	47,760
(-) variable selling costs [$\frac{79,600}{1} \times 0.1$].	<u>7,960</u>
Variable manufacturing cost.	<u>39,800.</u>

Statement showing "expected profit"

Particulars of costs.	[₹ 1000 ₹/unit].
Sales ($79,600 \times 500$)	500 units 750 units.
(-) variable manufacturing cost	39,800 ($69,600 \times 750$) 52,200.
(-) variable selling cost.	19,900 29,850.
(+) Salvage value	$[39,800 \times 500]$ $[39,800 \times 750]$
(-) cost of plant	3,980 5,220
Net Profit	$[39,800 \times 0.1]$ $[52,200 \times 0.1]$
	625 900
	<u>3,500</u> <u>5,200.</u>
	<u>13,045</u> <u>12,830.</u>

→ Development cost is sunk and is not relevant.

Advise:

Based on the above 'expected profit' statement which is purely based on financial considerations firm may go for high price - low volume i.e., 500 units level. However non-financial considerations are also given due importance as they account for actions that may not contribute directly to profits in the long run. Here it is important to note that life cycle of product is two years and there is no significant difference between the profits

of both levels. In the scenario firms may opt the plant having high capacity not only to increase its market share but also to establish a long run brand image.

ABC (Activity based costing)

Page No. 07.

Activity-based costing is an accounting methodology that designs assigns costs to activities rather than products or services. This enables resources & overhead costs to be more accurately assigned to products & services that consume them. ABC is a technique which involves identification of cost with each cost driving activity and making it as the basis for apportionment of costs over different cost objects / jobs / products / customers or services.

Example :-

ARUN ICE CREAMS.

Product-1	Product-2	Product-3
Electricity units consumed 500 units	250 units	250 units.

$$\text{Total electricity} = ₹ 150,000$$

$$\text{Electricity units} = 1000 \text{ units.}$$

$$\text{cost per unit} = 150,000/1000 = 150 \text{ per unit.}$$

Activity:

Electricity \rightarrow Activity, here, refers to an event that incurs cost.

Cost driver:

Units consumed \rightarrow It is a factor that causes a change in the cost of an activity.

Cost driver rate:

cost per electricity unit \rightarrow Total cost pool / cost driver.
= 150

Activity Cost pools

Ordering and Receiving → Number of purchase orders

Material Cost

Setting up machines cost → No. of set ups

Machinery costs → machine hours

Assembling Costs

→ No. of parts

Inspecting and testing costs → No. of tests

Painting costs → No. of parts

Supervising costs

→ Direct Labour hours

Problem no: 08.

Calculation of cost driver rate.

<u>Activity</u>	<u>Cost</u>	<u>Cost driver</u>	<u>cost driver rate.</u>
Store receiving	2,96,000.	Purchase requisition $(300 + 450 + 500) = 1250$	$\frac{2,96,000}{1250} = 236.8$
Inspection	8,94,000	No. of production runs $(750 + 1050 + 1200) = 3000$	$\frac{8,94,000}{3000} = 298.$
Dispatch	2,10,000	Orders executed $(180 + 270 + 300) = 750$	$\frac{2,10,000}{750} = 280$
Machine setup	12,00,000	No. of setups $(360 + 390 + 450) = 1200$	$\frac{12,00,000}{1200} = 1000.$

Calculation of cost per unit as per AB costing.

Particulars.	Product-A	Product-B	Product-C
Direct materials	5,00,000 $(10,000 \times 50)$	8,00,000 $(20,000 \times 40)$	12,00,000 $(30,000 \times 40)$
Direct labour @ ₹ 10/hour.	3,00,000 $(10,000 \times 3 \times 10)$	8,00,000 $(20,000 \times 4 \times 10)$	15,00,000. $(30,000 \times 5 \times 10)$
Stores receiving	71,040 (300×236.8)	1,06,560 (450×236.8)	1,18,400 (500×236.8)
Inspection	2,23,500 (750×298)	3,12,900 (1050×298)	3,57,600 (1200×298)
Dispatch	50,400 (180×280)	75,600 (270×280)	84,000 (300×280)
Machine setup.	3,60,000 (360×1000)	3,90,000 (390×1000)	4,50,000 (450×1000)
Total cost.	15,04,940	24,85,060	37,10,000.
Quantity produced	10,000	20,000	30,000.
Cost per unit	150.494	124.253	123.66.

Working note:- $\frac{30}{10} = 3$ $\frac{40}{10} = 4$ $\frac{50}{10} = 5.$

No. of hours/unit.

Problem no - 06.

- Computation of budgeted cost for the budgeted period.
- | Activity | Calculation. | Total cost. |
|----------|--------------|-------------|
|----------|--------------|-------------|

ATM services.

a. machine maintenance	4,00,000 (fixed)	
b. Rent.	2,00,000 (fixed)	
c. Currency	1,00,000 x 2 (doubled)	8,00,000.
Computer processing (5,00,000)	2,50,000 (fixed) 2,50,000 x 3 (3 times)	10,00,000.

Issuing statements. 20,00,000 20,00,000.

(8,00,000). 2 lakh statements increased to 2 lakh budgeted increase

Computer enquiries. 2,00,000 + 80%. 3,60,000

- Calculation of cost driver rate.

ATM service.	8,00,000.	ATM transactions	<u>8,00,000</u> = 4
		(1,50,000 + 50,000).	<u>2,00,000</u>

Computer processing	10,00,000	computer transactions	<u>10,00,000</u> = 0.5
		(15,00,000 + 3,00,000 + 2L)	<u>20,00,000</u>

Issuing statements	20,00,000	statements issued	<u>20,00,000</u> = 4
		(3.LL, 0.5L, 1L)	<u>5,00,000</u>

Computer enquiries.	3,60,000.	Telephone min	<u>3,60,000</u> = 0.5
		(3.6 L + 1.8 L + 1.8 L)	<u>7,20,000</u>

- Calculation of cost per unit as per AB costing.

Particulars. Deposits. Loans. credit loans.

ATM services. $1,50,000 \times 4 = 6,00,000$ - $50,000 \times 4 = 2,00,000$ computer processing $1.5 L \times 0.5 = 7,50,000$ $2 L \times 0.5 = 1 L$ $3 L \times 0.5 = 1.5 L$ issuing statements $3.5 L \times 4 = 14 L$ $0.5 L \times 4 = 2 L$ $1 L \times 4 = 4,00,000$ computer inquiries $3.6 L \times 0.5 = 1,80,000$ $1.8 L \times 0.5 = 90 K$ $1.8 L \times 0.5 = 90,000$ Total cost $29,30,000$ $3,90,000$ $8,40,000$

no. of products 58,600 13,000 14,000

cost per product 50 30 60.

Problem no-07.

* Calculation of cost driver rate.

Activity	cost.	cost driver-	cost driver rate
ATM service	1,00,000	ATM transactions $(1,80,000 + 20,000)$	$\frac{1,00,000}{2,00,000} = 0.5$
Computer processing	10,00,000	comp transactions $(20L + 2L + 3L)$	$\frac{10,00,000}{25,00,000} = 0.4$
Issuing statements	8,00,000	no.of statements $(3L + 0.5 L + 1.5 L)$	$\frac{8,00,000}{5,00,000} = 1.6$
customer inquiries	3,60,000	telephone minutes $(3.5L + 0.9L \times 1.6L)$	$\frac{3,60,000}{6,00,000} = 0.6$

* Calculation of cost per product as per AB costing.

Particulars	Checking a/c's.	Personal loans.	Gold visa
ATM service	90,000	-	10,000
	$(1,80,000 \times 0.5)$		$(20,000 \times 0.5)$
computer processing	8,00,000	80,000	1,20,000
	$(20,00,000 \times 0.4)$	$(200,000 \times 0.4)$	$(3,00,000 \times 0.4)$
Issuing statements	4,80,000	80,000	2,40,000
	$(3,00,000 \times 1.6)$	$(50,000 \times 1.6)$	$(1,50,000 \times 1.6)$
customer inquiries	2,10,000	54,000	96,000
	$(3,50,000 \times 0.6)$	$(90,000 \times 0.6)$	$(1,60,000 \times 0.6)$
Total cost.	15,80,000	2,14,000	4,66,000
No. of units.	30,000	5,000	10,000
cost per product	52.66	42.8	46.6

Problem no :- 02.

* Calculation of cost driver Rate.

Activity	cost	cost driver	cost driver rate
machine dep exp	18,48,000	machine hours $(30k + 48k + 54k)$	$\frac{18,48,000}{1,32,000} = 14$
assembly dep exp	6,72,000	assembly hours $(15k + 27k)$	$\frac{6,72,000}{42,000} = 16$
set up costs	90,000	production runs $(150 + 120 + 180)$	$\frac{90,000}{450} = 200$
stores receiving cost	1,20,000	requisition on stores $(40 + 30 + 50)$	$\frac{1,20,000}{120} = 1000$
order processing	1,80,000	orders executed $(1250 + 1000 + 1500)$	$\frac{1,80,000}{3750} = 48$
Inspection cost	36,000	production runs $(150 + 120 + 180)$	$\frac{36,000}{450} = 80$

* Calculation of cost per product as per AB costing.

Activity	Product-P	Product-Q	Product-R
Machine dep exp	4,20,000	6,72,000	7,56,000
assembly dep exp	2,40,000 $(15,000 \times 16)$	-	4,32,000 $(27,000 \times 16)$
setup costs	30,000 (150×200)	24,000 (120×200)	36,000 (180×200)
stores receiving cost	40,000 (40×1000)	30,000 (30×1000)	50,000 (50×1000)
order processing	60,000 (1250×48)	48,000 $(1,000 \times 48)$	72,000 (1500×48)
Inspection cost	12,000 (150×80)	9,600 (120×80)	14,400 (180×80)
Total cost	8,02,000	7,83,600	13,60,400
no. of units	15,000	12,000	18,000
cost per unit	53.46	65.3	75.57

Problem no :- 09.

i. Calculation of cost per unit as per traditional method.

Particulars	Product-P	Product-Q	Product-R.
Direct material cost.	2,70,000 (3000×90)	4,00,000 $(5,000 \times 80)$	24,00,000. $(20,000 \times 120)$
Direct labour cost	2,40,000 $(20 \times 4 \times 3000)$	12,00,000 $(20 \times 12 \times 5000)$	32,00,000 $(20 \times 8 \times 20,000)$.
Production O.H	1,80,000 $(10 \times 6 \times 3000)$	5,40,000 $(18 \times 6 \times 5000)$	16,80,000 $(14 \times 6 \times 20,000)$.
Total cost	6,90,000	21,49,000	72,80,000.
No. of units	3,000	5,000	20,000.
Cost per unit	230	428	364.

ii. Calculation of cost driver rate.

Activity	cost.	cost driver	cost driver rate
Machine setup cost	4,80,000	Machine hours - $(30k + 90k + 280k)$	<u>4,80,000</u> = 1.2 4,00,000
Machine operation cost	7,20,000	Machine hours $(30k + 90k + 280k)$	<u>7,20,000</u> = 1.8 4,00,000
Inspection costs	9,60,000	No. of Inspections $(100 + 40 + 60)$	<u>9,60,000</u> = 4,800 200
Material costs	2,40,000	Purchase orders $(60 + 100 + 160)$	<u>2,40,000</u> = 750. 320

Working note- 01:

Calculation of total overheads.

Particulars	P	Q	R
Machine hours	$3000 \times 10 \times 6$ 1,80,000	$5000 \times 18 \times 6$ 5,40,000	$20,000 \times 14 \times 6$ 16,80,000.
Total overheads = 24,00,000.			

Calculation of cost per unit as per ABC costing.

Particulars	Product - P.	Product - Q	Product - R.
Direct material cost	2,70,000 (3,000 x 90)	4,00,000 (5,000 x 80)	24,00,000 (20,000 x 120)
Direct labour cost	2,40,000 (20 x 4 x 3000)	12,00,000 (20 x 12 x 5000)	32,00,000 (20 x 8 x 20,000)
Machine setup cost	36,000 (30,000 x 1.2)	1,08,000 (90,000 x 1.2)	3,36,000 (2,80,000 x 1.2)
Machine operation cost.	54,000 (30,000 x 1.8)	1,62,000 (90,000 x 1.8)	504,000 (2,80,000 x 1.8)
Inspection costs	4,80,000 (100 x 4800)	1,92,000 (40 x 4800)	2,88,000 (60 x 4800)
Material costs	45,000 (60 x 750)	75,000 (100 x 750)	1,20,000 (160 x 750)
Total cost	11,25,000	21,37,000	68,48,000
No. of units	3,000	5,000	20,000
Cost per unit	375	427.4	342.4.
<u>Working note - 02:-</u>			
Machine setup costs	= 24,00,000 x 20%.	= 4,80,000	
Machine operation costs	= 24,00,000 x 30%.	= 7,20,000	
Inspection costs	= 24,00,000 x 40%.	= 9,60,000	
Material costs	= 24,00,000 x 10%.	= 2,40,000.	

Particulars	Product - P.	Product - Q	Product - R.
No. of batches	20	10	20
	(3000 ÷ 150)	(5000 ÷ 500)	(20,000 ÷ 1000)
No. of inspections.	100 (20 x 5)	40 (10 x 4)	60 (20 x 3)
No. of purchase orders.	60 (20 x 3)	100 (10 x 10)	160. (20 x 8)

Alternative:-

Machine setup cost. cost driver can be

machine hours (or) batch size.

Problem no - 08.

i.	Calculation of operating income and % as per trad. method		
Particulars			
Revenues	Lemon.	Grapes	Papaya.
(-) C.O.G.S	79,350	2,10,060	1,20,990.
other costs (90k)	60,000	1,50,000	90,000
	$(90k \times \frac{2}{10})$	$(90k \times \frac{5}{10})$	$(90k \times \frac{3}{10})$
Operating income	1350	15,060	3,990.
% of operating inc	1.70%	7.17%	3.30%.

Working note :-

Calculation of all other costs.

Here all costs does not include cost of goods sold.

Bottle returns	= 1200
ordering	= 15,600
Delivery	= 25,200
Self stocking	= 17,280
customer support	= 30,720.
Total	= 90,000.

\Rightarrow Here other costs are apportioned on the basis of cost of goods sold.

Working note :-

Calculation of percentage of operating income.

Lemon	Grapes	Papaya.
$= \frac{1350}{79,350} \times 100$	$= \frac{15,060}{2,10,060} \times 100$	$= \frac{3,990}{1,20,990} \times 100$
= 1.70%	= 7.17%	= 3.30%.

ii. Calculation of operating income & % as per AB costing	Lemon.	Grapes.	Papaya.
Particulars			
Revenue.	79,350	2,10,060	1,20,990
(\rightarrow) COGS	60,000	1,50,000	90,000.
cost of bottles return	1,200	-	-
ordering cost	3600	8,400	3,600
	(36×100)	(84×100)	(36×100)
Delivery cost.	2,400	17,520	5,280.
	(30×80)	(219×80)	(66×80)
Self stocking cost	1080	10,800	5,400
	(54×20)	(540×20)	(270×20)
Customer support.	2,620	22,080	6,120.
	($12,600 \times 0.2$)	($110,400 \times 0.2$)	($30,600 \times 0.2$)
Operating Income.	8,550	1,260	10,590
Percentage.	10.77%.	0.59%.	8.75%.

Working note :-

Calculation of cost driver rate.

Activity	cost.	cost driver.	cost driver rate
Ordering	15,600	No. of purchase orders ($36 + 84 + 36$)	$\frac{15,600}{156} = 100$
Delivery	25,200	No. of deliveries ($30 + 219 + 66$)	$\frac{25,200}{315} = 80$
Self stocking	17,280	Shelf stocking hrs ($54 + 540 + 270$)	$\frac{17,280}{864} = 20$
Customer support	30,720	Items sold ($12,600 + 110,400 + 30,600$)	$\frac{30,720}{153,600} = 0.2$

\Rightarrow Bottles returns cost is directly allocated to "lemon".

Problem no-05

i. Calculation of product as per traditional costing.

Particulars	Product-A.	Product-B	Product-C
Sales	4,50,000	7,84,000	3,24,000
($25,000 \times 18$)	($56,000 \times 14$)	($27,000 \times 12$)	
(-) prime cost	3,02,400	5,05,800	2,16,720
($25,200 \times 12$)	($56,200 \times 9$)	($27,090 \times 8$)	
(-) other cost	89,641	2,00,796	96,813
Profit	57,959	77,404	10,467
Rank	2	1	3

Working Note :-

Calculation of production runs

Particulars	Product-A.	Product-B	Product-C
Good units	2520 - 20	2810 - 10	3010 - 10
	= 2,500	= 2,800	= 3,000
Sales units	$\frac{25000}{2500} = 10$	$\frac{56000}{2800} = 20$	$\frac{27000}{3000} = 9$
good units			
Production runs	10	20	9

Working note :-

Calculation of production units.

Production units = Gross units / Production run \times
No. of production runs.

$$\text{Product - A} = 2520 \times 10 = 25,200 \text{ units}$$

$$\text{Product - B} = 2810 \times 20 = 56,200 \text{ units}$$

$$\text{Product - C} = 3010 \times 9 = 27,090 \text{ units.}$$

$$\text{Total overheads} = 73,000 + 1,42,000 + 10,250 + 1,62,000 = 3,87,250.$$

These overheads are allocated on the basis of units sold.

ii. Calculation of profit as per AB costing

Particulars	Product - A.	Product - B	Product - C
Sales	4,50,000	7,84,000	3,24,000
(-) prime cost	3,02,400	5,05,800	2,16,720
Inspection cost	15,000 $(3 \times 10 \times 500)$	40,000 $(4 \times 20 \times 500)$	18,000 $(4 \times 9 \times 500)$
Machine maintenance	40,000 $(200 \times 10 \times 20)$	48,000 $(2000 \times 20 \times 1)$	54,000 $(200 \times 9 \times 30)$
Dye cost	2,000 $(200 \times 10 \times 1)$	6,000 $(300 \times 20 \times 1)$	2,250 $(250 \times 9 \times 1)$
Selling overheads	-	56,000	23,000
	-	54,000	-
	<u>5787</u>	<u>12,963</u>	<u>6,250</u>
Profit	84,813	61,237	(220)
Rank.	1	2	3.

Working note :-

Calculation of cost driver rate.

Activity	cost	cost driver	cost driver rate
Inspection	73,000	Inspection hours $(30 + 80 + 36)$	$\frac{73,000}{146} = 500$
Machine cost	1,42,000	Machine hours $(200 + 240 + 270)$	$\frac{1,42,000}{710} = 200$
Dye cost	10,250	Dye cost $(2000 + 6000 + 2250)$	$\frac{10,250}{10,250} = 1$
Selling O.H	1,62,000	Sales units $(25,000 + 56k + 27k)$	$\frac{1,62,000}{1,08,000} = 1.5$

$$\text{No. of Inspection hours} \quad 3 \times 10 = 30 \quad 4 \times 20 = 80 \quad 4 \times 9 = 36$$

$$\text{No. of machine hours} \quad 20 \times 10 = 200 \quad 12 \times 20 = 240 \quad 30 \times 9 = 270$$

$$\text{Dye cost} \quad 200 \times 10 = 2000 \quad 300 \times 20 = 6000 \quad 250 \times 9 = 2250$$

Problem no - 10.

i. Calculation of Total cost of the product as per traditional costing			
Particulars			
Direct material	Product-A	Product-B	Product-C
	32,000	36,000	9,600
	(4000 × 4 × 2)	(3000 × 6 × 2)	(1600 × 3 × 2)
Direct labour	20,000	22,500	16,000
	[4000 × 30 / 60]	[3000 × 45 / 60]	[1600 × 60 / 60]
Production OH	34,000	38,250	27,200
	(2000 × 17)	(2250 × 17)	(1600 × 17)
Total cost	86,000	96,750	52,800

Working note :

Calculation of labour hours and direct labour rate.

$$\text{Product - A} = \frac{4000 \times 30}{60} = 2000 \text{ hours; Product - B} = \frac{3000 \times 45}{60} = 2250$$

$$\text{Product - C} = \frac{1600 \times 60}{60} = 1600 \text{ hours; Rate} = \frac{\text{₹ } 99,450}{5850} = 17/\text{hour.}$$

⇒ Above overhead is allocated on the basis of labour hour.

ii. Calculation of total cost of the product as per AB costing

Particulars	Product-A	Product-B	Product-C
Direct material	32,000	36,000	9,600
Direct labour	20,000	22,500	16,000
Material handling	12,000	13,500	3,600
	(16,000 × 0.75)	(18,000 × 0.75)	(4,800 × 0.75)
Storage costs	10,400	5,200	15,600
	(10 × 1040)	(5 × 1040)	(15 × 1040)
Electricity	25,944	9,729	3,459.2
	(24 k × 1.081)	(9k × 1.081)	(3,200 × 1.081)
Total cost	1,00,344	86,929	48,259.

Working note : Calculation of total direct material.

$$A = 4000 \text{ units} \times 4 \text{ kg} = 16,000; B = 3000 \times 6 = 18,000; C = 1600 \times 3 = 4,800$$

Calculation of labour rate per hour (completed)

Calculation of cost driver rate.

Activity	cost	cost driver	cost driver rate
Material cost	29,100	weight of material $(16k + 18k + 4800)$	$\frac{29,100}{38,800} = 0.75$
Storage cost	31,200	batches of material $(10 + 5 + 15)$	$\frac{31,200}{30} = 1040$
Electricity	39,150	machine operations $(24k + 9k + 3,200)$	$\frac{39,150}{36,200} = 1.081$

Question no :- 10

ABC Ltd is a multiproduct company, manufacturing 3 products A, B and C.

	A	B	C
Production units	4000	3000	1600

Resources per unit :

Direct materials (kg)	4	6	3
Direct labour (min)	30	45	60

Direct labour rate per hour = £ 10

Direct material cost per kg = £ 2

Production budgeted overheads = £ 99,450 (Labour hour rate)

Activity	cost	cost driver
Material handling	29,100	weight of material
Storage costs	31,200	No. of batches of material
Electricity	39,150	No. of machine operations

Data on cost drivers:

A B C

For complete production :

Batches of material 10 5 15

per unit of production :

number. of machine operations. 6 . 3 . 2

Problem no - 11

i. Calculation of cost driver rate.

Activity	cost	cost driver	cost driver rate
Power	2,00,000	Kilowatt hours $(10k + 20k + 15k)$	$\frac{2,00,000}{50,000} = 4$
quality inspections	3,00,000	No. of Inspections $(10,000)$	$\frac{3,00,000}{10,000} = 30$

Calculation of total cost as per AB costing

Particulars	Product-M	Product-S	Product-T
Power	40,000 $(10,000 \times 4)$	80,000 $(20,000 \times 4)$	60,000 $(15,000 \times 4)$
quality inspections	1,05,000 $(3,500 \times 30)$	75,000 $(2,500 \times 30)$	90,000 $(3,000 \times 30)$

ii. Computation of cost of unused capacity for each activity

Particulars	Amount (₹)
-------------	------------

Power $(2,00,000 - 1,80,000)$ or 5000×4	20,000
--	--------

quality inspections $(3,00,000 - 2,70,000)$ or 1000×30	<u>30,000</u>
---	---------------

Total cost of unused capacity	50,000
-------------------------------	--------

Activity	cost driver	capacity	cost
Power	Kilowatt hours	50,000 Kilowatt hr	₹ 2,00,000
quality inspections	no. of inspections	10,000 Inspection	₹ 3,00,000
Product	kilowatt hours	quality inspections	
M	10,000	3,500	
S	20,000	2,500	
T	15,000	3,000	

iii. Calculate the cost of unused capacity for each activity

Problem no : 12.

Q. RST limited specializes in the distribution of pharmaceutical products.

The following data for the month of April in respect of RST limited has been reported :

Particulars	Supermarket	Drugstore	Chemist
Average revenue per delivery	84,975	28,875	5,445
Average COGS per delivery	82,500	27,500	4,950
No. of deliveries	330	825	2,750

The Analysis activity analysis of RST limited is as under:

Activity Area. Cost driver-

Customer purchase order processing → purchase orders by customers.

Line-item ordering → Line-items per purchase orders.

Store delivery → Store deliveries.

Cartons dispatched to stores → carton dispatched to stores/deliveries

Shelf-stocking at customer store → hours of shelf-stocking.

⇒ operating costs (other than COGS) = ₹ 827,970.

⇒ Activity area Total cost. cost allocation base

customer purchase order ₹ 20,000 5,500 orders

line-item ordering 1,75,560 58,520 line items

store delivery 1,95,250 3,905 store deliveries

carton dispatched to store. 2,09,000 2,09,000 cartons

shelf stocking at customer store 28,160 1760 hours

super market. drugstore chemist

No. of orders 385 990 4,125

No. of line items per order 14 12 10

No. of stores deliveries 330 825 2,750

No. of cartons per store delivery 300 80 16

Avg. no. of shelf stocking/store delivery 3 0.6 0.1

i. Calculation of operating income % as per traditional costing

Particulars	Supermarket.	Drug store	Chemist
Revenue	2,80,41,750	2,38,21,875	1,49,73,750
($330 \times 84,975$)	($825 \times 28,875$)	(2750×5445)	
(-) COGS	2,72,25,000	2,26,87,500	1,36,12,500
	($330 \times 82,500$)	($825 \times 27,500$)	(2750×4950)
Gross margin	8,16,750	11,34,375	13,61,250
% of gross margin	2.91%	4.76%	9.09%

$$\text{Total Revenue} = 6,68,37,375$$

$$(-) \text{ total COGS} = 6,35,25,000$$

$$= \text{gross margin} = 33,12,375$$

$$(-) \text{other operating cost} = 8,27,970$$

$$\text{operating income} = 24,84,405$$

$$\% \text{ of operating income} = \frac{24,84,405}{6,68,37,375} = 3.72\%$$

ii. Computation of cost driver rate

Activity	cost	cost driver	cost driver rate
Purchase order	2,20,000	No. of orders $(385 + 990 + 4125)$	$\frac{2,20,000}{5,500} = 40$
line item	1,75,560	No. of line orders $(5390 + 11,880 + 41,250)$	$\frac{1,75,560}{58,250} = 3$
Store delivery	1,95,250	No. of store deliveries $(380 + 825 + 2750)$	$\frac{1,95,250}{3905} = 50$

Problem no - 01

Working note-01:

Calculation of no. of units.

$$= \text{No. of setups for current period} \times \text{units per run}$$

$$= 42 \times 960 = 40,320 \text{ units.}$$

Working note-02:

Calculation of no. of setups for proposed change.

$$= \frac{40,320}{1008} = 40 \text{ production runs.}$$

$$\left[\frac{\text{no. of units}}{\text{no. of production runs}} \right]^P$$

i: Calculation of Break even production. [for proposed]

= Fixed costs
contribution

$$= \underline{72,100 + [40 \times 360] + [422 \times 10]} \cdot \\ [10 - 5]$$

= 18,144 units [changed scenario].

$$\therefore \underline{(\text{fixed cost} + [\text{overhead} \times (\text{450} - 90)] + [\text{engineering hours} \times \text{cost per en. hours}]} \\ [\text{selling price} - \text{direct cost}]$$

ii: Reason:

Generally there is no requirement to follow AB costing because it is a single product. However after analysing AB costing, it has resulted in cost fixed cost savings.

So, it is better to follow AB costing even it is a single product.

Problem no - 04.

- i. Statement showing total cost of products under traditional method.

Particulars	Product - P	Product - Q
Direct material	6000	4000
Direct labour	5,760 (960×6)	600 (100×6)
Overheads	50,400 (960×52.5)	5,250 (100×52.5)
Total cost	62,160	9,850
No. of units	15,000	5,000
cost per unit.	4.144	1.97.

Working note:-01

Calculation of overhead rate per labour hour

1. machine operation expenses = 10,12,500
 2. Machine maintenance expenses = 1,87,500
 3. Salaries of technical staff = 6,37,500
 4. Wages and salaries of stores = 2,62,500
- Total overheads 21,00,000.

Here overheads are allocated on the basis of labour hours.

Total labour hours = 40,000

$$= \frac{21,00,000}{40,000} = 52.5$$

Working note-02:

Statement showing apportionment of technical salaries.

Particulars	machine main- tenance	setup	quality inspection.
Technical salary			
6,37,500 (30:40:30)	1,91,250	2,55,000	1,91,250

Working note-03:

Statement showing apportionment of machine operation expenses & machine maintenance expenses.

Particulars	stores	Production/setup
Machine maintenance		
Machine operation	2,78,250	11,13,000
(10,12,500 + 1,87,500 + 1,91,250)		
(20 : 80)		

Working note-04: Calculation of cost driver rate.

Particulars	stores	setup/production	Quality
Working note-02	2,78,250	11,13,000	-
Working note-01	-	2,55,000	1,91,250
Wages & salaries of stores staff	2,62,500	-	-
Total	5,40,750	13,68,000	1,91,250
Driver	1,960	2040	1280
Driver rate	275.89	670.59	149.41

ii. Statement showing computation of product - P & product - Q

Particulars	Product - P	Product - Q
Direct material	6000	4000
Direct labour	5760	600
Receiving cost (stores)	13,228	14,346.28
	(48 × 275.89)	(52 × 275.89)
Setup cost	4428	16,094.16
	(36 × 670.59)	(24,670.59)
quality Inspection.	24,161	1494.1
	(30 × 149.41)	(10 × 149.41)
Total cost		
No. of units		
cost per unit.		

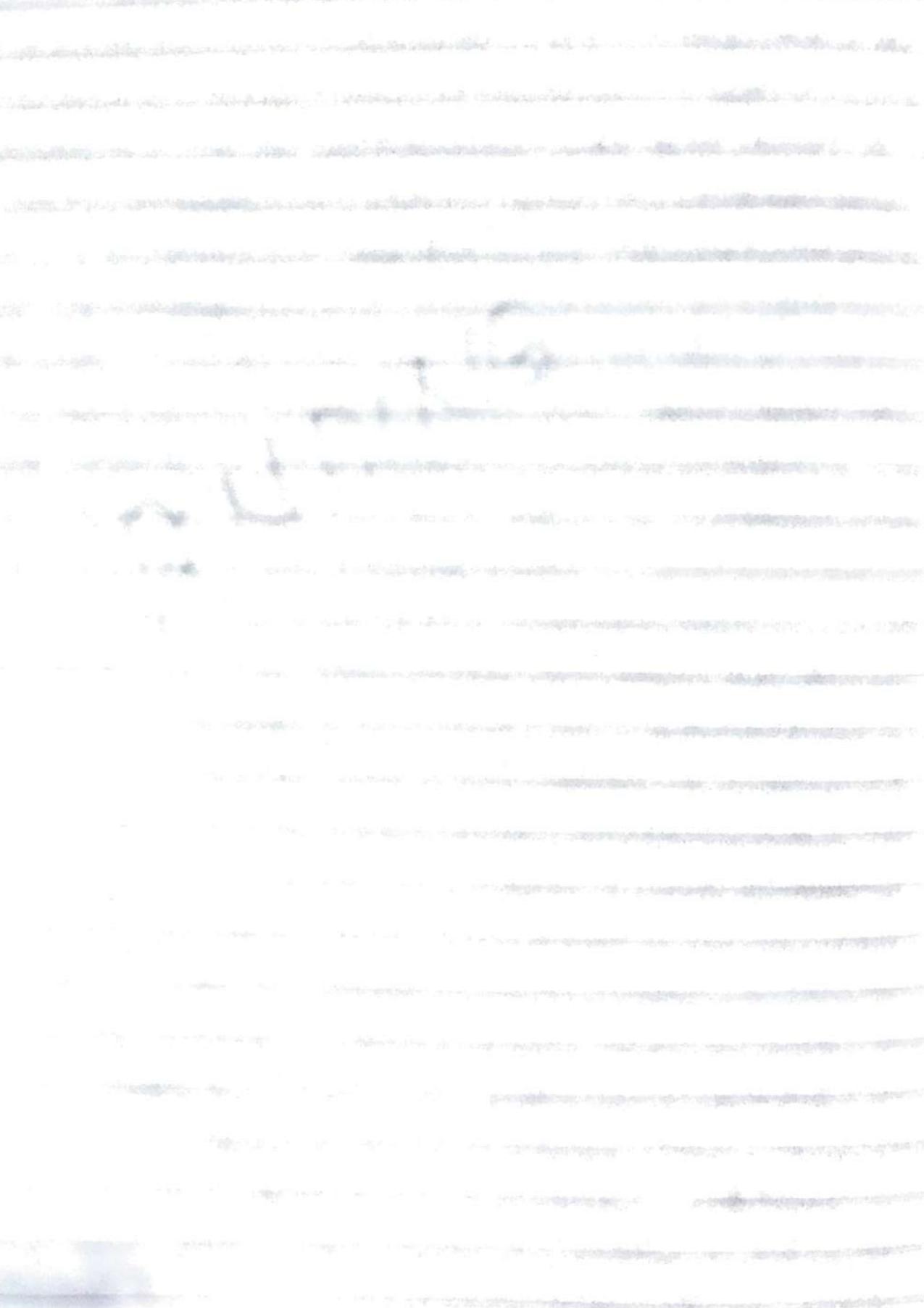


Illustration no - 08 Page no - 280. Study Material

Profitability statement [given by manager suggestion]

Particulars	Product-A	Product-B
Sales units	75,000	75,000
Sales price	330	275
Total Sales	34,750,000	2,06,25,000
(-) Less:		
Direct Material (125)	(93,75,000)	(93,75,000)
Direct Labour @ (24)	(18,00,000)	(18,00,000)
Direct Expenses @ 36.	(27,00,000)	(27,00,000)
* (-) Overheads (working note-01)	(75,67,714)	(30,27,086)
(-) other overheads (23.544)	(17,65,800)	(17,65,800)
	15,41,486	19,57,114

$$\text{Total profit} = 15,41,486 + 19,57,114 = 34,98,600$$

$$\text{Traditional profit} = ? \quad 2564,350$$

∴ Hence Manager suggestion is viable

Working Note-01: Calculation of total O.H

Particulars	Amount
No. of units (147,50 x 95)	1,41,26,400
75% on 1,41,26,400	105,94,800
25% on 1,41,26,400	35,31,600

In subcontracting

Product-A

$$1,05,94,800 \times \frac{5}{7} = 75,67,714.$$

Product-B

$$1,05,94,800 \times \frac{2}{7} = 30,27,086.$$

$$\text{Factory O.H.} = \frac{35,31,600}{150,000} = 23.544$$

$$23.544.$$