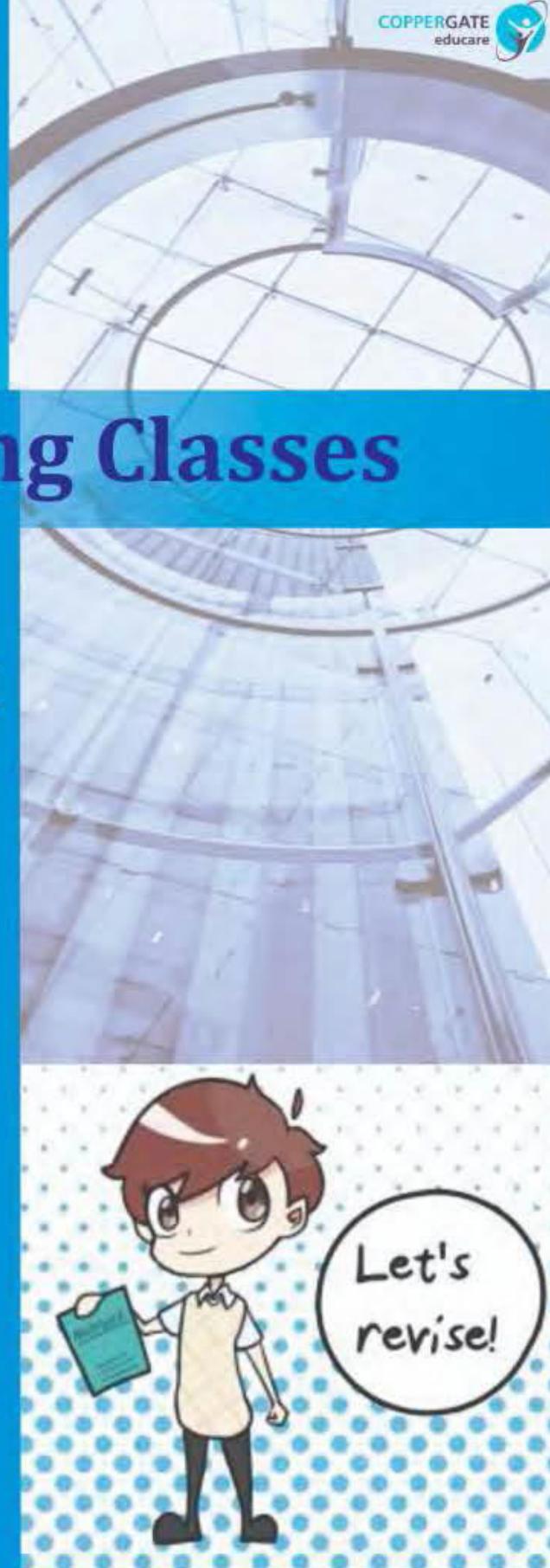


CA Final

CA Coaching Classes

CA Final LMR
New Syllabus
Solution BOOK

Strategic Cost Management
&
Performance Evaluation



BY
Prof.Dani Khandelwal

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ABOUT THE AUTHOR



Prof. Dani Khandelwal is a Chartered Accountant and practising International Cost Consultant.

He conducts Cost Accountancy and OR lectures, face to face in Mumbai.

He has been a visiting faculty at WIRC Mumbai, Goa and Gujarat. Visiting Faculty at Bombay Chartered Accountants Society (BCAS).

He has given coaching to thousands of students; he is into Coaching since last 15 years.

His teaching method is so simplified that over a period the Cost Accountancy subject is known amongst students as Dani ki Costing.

He is available to students 365 days a year on phone also.

He has written several Books on Cost Accountancy, Operations Research and Financial Management.

For Final year students he has prepared Video Lectures and Hard book (Full course), Last Minute Revision (LMR) Video Lectures and Hard book, Practice Manual (PM) Hard book.

I recommend him as a true friend of all CA students.

CA LM Agrawal
Partner
Coppergate Educare.

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STRATEGIC COST MANAGEMENT & PERFORMANCE EVALUATION

CA Final New Course

Paper-5 Group-II

**Author
Prof. Dani Khandelwal (CA)**

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ALL THE BEST

SEQUENCE FOR SCMPE (CA FINAL)

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ALL THE BEST

Standard costing

(Page 65 - 78)

Case study

Theory

~~Practicality~~

Practical.

Step:-1 Cost sheet (Total cost of product + Profit)

Particulars.

Unit-
1000-SI

Direct cost

DM 100 000

DL 100 000.

D Exp. -

Indirect cost

Total cost 200 000.

Profit 200 000

Sales. 400 000

* When ever unit is a quantity Paul always take Standard Rate

* When ever unit is a date Paul always take Actual quantity.

Direct material :-

	Production manager	Purchase manager	Total cost
Budget	10,000	x 10	100,000.
Actual	11,000	x 11	121,000

Direct labour .

	Production manager	Rate manager.	Total cost
Budget	10000 hrs	x 10	100,000
Actual	11000	x 11	121,000

Step :- 2 Profit / loss A/c .

To material.	121000	By Sales .	400,000.
To D. L	121000.		
To Net profit.	(158000)		

Step :- 3 Statement showing Reconciliation .

Profit as per cost sheet 20000.

Due to material. 21000.

Due to Labour 21000

Profit as per profit / loss A/c 158000

Step :- 4 Analysis of Variance .

material. $(100,000 - 121,000) = 21,000$. Adverse .

not significant fluctuation

5- Production manager

$(10,000 - 11,000) \times 10$

10,000 Adverse .

Purchase manager

$(10 - 11) \times 11,000$

= 11,000 (A)

material usage variance

$(E2 - AR) \times AQ$.

\$ (20 - 10) \times 11,000

Point to be remember

~~#~~ At the time of analysis for variance
(case study)

1. When ever there is a quantity part multiply by Standard rate.

2. When ever there is a rate part multiply by Actual quantity

3. Analysis of material, labour, variable overhead is always based on actual production
(make data for the concerned period)

3. Budgeted profit = Budgeted selling price
 less (Budgeted cost)

but Actual profit = Actual selling price
 less (Budgeted cost)

Because profit manager is not responsible for cost fluctuation

Profit Manager

	Budget	Actual	SP	Cost	Profit unit	
	S,	S,	100	80	20	1000
				90.	10	1000

Production
manager

not profit
manager

Steps for slowing the sum.

1. Tabulation -form
 2. Analysis of variance.

Seller - Turnover variance

Sales margin variance

Cost variance

Material

601

Variance

Loboue

607

Vocacione

Overhead

201

Variance

fixed

Overhead

Veniable.

Overhead.

C.S 7565 Step 1 Sales - Turnover varianceStandard.

$$\text{Ponduri Qty} \times \text{Rate} = \text{amr}$$

$$x \quad 240 \times 50 = 12000$$

$$y \quad 160 \times 25 = 4000$$

$$400 \quad 16000$$

$$\text{Qty} \times \text{Rate} = \text{amr}$$

$$400 \times 45 = 18000$$

^

$$200 \times 20 = 4000$$

$$600 \quad 22000$$

Step 2 Analysis of Variance.

$$16000 - 22000 = 6000 (\text{F})$$

$$(\text{Std sales} - \text{Actual sale})$$

Sales Volume variance

$$x \quad (240 - 400) \times 50 = 8000 (\text{F})$$

$$y \quad (160 - 200) \times 25 = 1000 (\text{F})$$

$$9000 (\text{F}).$$

Sales price variance

$$(50 - 45) \times 400 = 2000 (\text{A})$$

$$(25 - 20) \times 200 = 1000 (\text{A})$$

$$3000 (\text{A}).$$

$$(\text{SR} - \text{AR}) \times \text{SR}$$

$$(\text{SR} - \text{AR}) \times \text{AC}$$

Sales sub volume

$$(400 - 600) \times \frac{16000}{400} = 8000 \text{ F.}$$

Sales mix variance

$$x \quad \left(\frac{240}{400} \times 600 \right) (360 - 240) \times 50 = 2000 \text{ F}$$

$$y \quad \left(\frac{160}{400} \times 600 \right) (240 - 160) \times 25$$

1000 A

1000 F

$$(\text{TSQ} - \text{TAC}) \times \text{Std Avg Rate}$$

$$(\text{RSQ} - \text{AQ}) \times \text{Std. Rate}$$

Step-1 Sales margin variance.

Standard

Actual

	City	Sale	Amt	City	Sale	Amt
X	240	20	4800	400	(45-30)	1500
	(50-30)					
Y	160	10	1600	200	20-15	1000

Step-2 Sales Margin Variance.

$$(6400 - 7000) = 600 \text{ (F)}$$

Sales margin volume variance.

Sales margin rate variance.

$$2 (240 - 400) \times 20 = 3200 \text{ (F)}$$

$$(20-15) \times 400 = 2000 \text{ (A)}$$

$$y (160 - 200) \times 10 = 400 \text{ (F)}$$

$$(10-5) \times 200 = 1000 \text{ (A)}$$

$$3600 \text{ (F)}$$

$$3000 \text{ (A)}$$

$$(SRQ - ARQ) \times SR$$

$$(SRQ - ARQ) \times ARQ$$

Sales margin.

Sales margin

Sub volume variance

mix variance

$$2 (400 - 600) \times \frac{6400}{400}$$

$$2 \frac{240}{400} \times 600 (360 - 400) \times 20$$

$$= 800 \text{ (F)}$$

$$= 3200 \text{ (F)}$$

$$(\text{SRQ} - \text{RAQ}) \times \text{Std. Avg}$$

$$y \frac{160}{400} \times 600 (240 - 200) \times 10$$

Rate.

400 A

$$400 \text{ (F)}$$

$$(\text{SRQ} - \text{ARQ}) \times SR$$

* Sales price variance is always equal to sales margin price variance.

Analysis of Material Variance is always based on actual production.

CS #6 Note no :- 1

85 Standard input for actual output

Actual output Standard input

100 unit

800 kg.

500 unit

$$\frac{800}{100} \times 500 = 4000 \text{ kg}$$

Step:-1 Material variance = (Actual production - Standard) \times Standard

kg	Rate	Ans
4000	5	20000

kg	Rate	Ans
4400	5.3	23320

Material cost variance

$$\text{Std. Cost} - \text{Actual Cost} = 20000 - 23320 = 3320 \text{ (A)}$$

material usage variance

Production margin:

$$(4000 - 4000) \times 5$$

$$= 2000 \text{ A}$$

$$(SQ - AQ) \times SR$$

material rate var.

$$(5 - 5.3) \times 4400$$

$$1320 \text{ (A)}$$

$$(SR - AR) \times AQ$$

Material Yield / Output variance

Input Output

4000

5000

4400

550 ?

$$(550 - 500) \times \frac{20000}{500}$$

500

$$= 2000 \text{ A.}$$

Analysis of labour variance is also based on actual production.

C.S.F.T Standard hrs for actual production.
a

$$65 \text{ hrs} \times \frac{180}{100} \times 1600 = 2880 \text{ hrs.}$$

$$\text{Semi} \quad \frac{120}{100} \times 1600 = 1920 \text{ hrs.}$$

$$\text{Unskill} \quad \frac{300}{100} \times 1600 = 4800 \text{ hrs}$$

Step:-1 Labour variance based on Actual production.
1600 units.

Standard

	Hrs	Rate	Amr
Skill	2880	5	14400
Semi	1920	3	5760
Unskill	4800	2	9600
	9600		29760

	Hrs	Rate	Amr
	3000	5.20	15600
	2000	2.50	5000
	5000	1.80	9000
	10000		29600

Step:-2. Labour cost variance

$$(29760 - 29600) : 160 \text{ f}. \\ \text{SC - AC}$$

Labour Efficiency variance

Labour rate varia

$$\text{Skill} \quad (2880 - 3000) \times 5 = 600 \text{ (A)}$$

$$(5 - 5.20) \times 3000 = 600 \text{ A}$$

$$\text{Semi-Ski} \quad (1920 - 2000) \times 3 = 240 \text{ (A)}.$$

$$(3 - 2.50) \times 2000 = 1000 \text{ f.}$$

$$\text{Unskill} \quad (4800 - 5000) \times 2 = 400 \text{ (A)}.$$

$$(2 - 1.80) \times 5000 = 1000 \text{ f.}$$

$$1200 \text{ (A)}$$

$$1400 \text{ (f.)}$$

$$(SH - AH) \times SR$$

$$(SR - AR) \times AH.$$

Labour Sub efficiency

P70

$$\text{Input} \quad (1600 - 10000) \times \frac{29760}{9600} = (TSI - TAH) \times \frac{\text{P70}}{\text{SAR}}$$

↓

$$1200 \text{ (A)}.$$

Labour Gang mix variance

$$\text{P70} - (1)$$

① Labour Yield Variance

hrs	unit
9600.	1600.
10000	1666.66.

$$(1666.66 - 1600) \times \frac{29760}{1600} = 1240 A.$$

(Std output from actual mix - Actual output from actual mix) * Std avg rate of output

② Labour Mixing Yield Variance.

$$5K \quad \frac{2800}{9600} \times 10000 = (3000 - 3000) \times 5 = 0$$

$$\text{Semi SKILL} \quad \frac{1920}{9600} \times 10000 = (2000 - 2000) \times 3 = 0$$

$$\text{unskilled} \quad \frac{4800}{9600} \times 10000 = (5000 - 5000) \times 2 = 0$$

$$(RSH - AH) \times \text{Std Rate}$$

Application of Abnormal Ideal Time in labour variance.

Ideal time

Normal



Uncontrollable



Change to
customers

Abnormal



Controllable



Change to
Cooking Pil Alc

CS. 37
65 Labour variance
Standard.

hrs	Rate	dmr	hrs	Rate	dmr
1000	0.50	500.	12000	0.30	360.

12
↓

Abnormal.
Ideal time = 100 hrs.

Labour cost variance $(500 - 360) = 140 \text{ (F)}$.

Labour efficiency
variance

$$(1000 - 1200) \times 0.5 = 100 \text{ A.}$$

Labour
Ideal
Time variance.
 100×0.5
= 50 A.

Labour rate vari.
 $(0.50 - 0.30) \times 12000$
= 240 (F).

Analysis of variable overhead is also based on actual production.

Given

Actual production	Std hrs	s.r.
1 unit	2.	0.50 ph.

Actual production - Actual hrs Actual rate.
1000 hrs. 2500 0.60

Step II V.OH variance.

Standard

hrs	rate	dmr
2000	0.5	1000
1000×2		

Actual:

hrs	rate	dmr
2500	0.6	1500
2500	0.6	1500

variable overhead cost variance

$$(1000 - 1500) = 500 \text{ A.}$$

V.O Eff.

$$(SC - AC.)$$

V.OH late variance

$$(200 - 250) \times 0.5$$

$$250 \text{ A.}$$

$$0.5 \times 50 \times 2500$$

$$250 \text{ A.}$$

$$(SH - AH) \times SR$$

$$(SR - AR) \times AH$$

CS #8 Step:1 MATERIAL VARIANCE - based on actual production

66

Standard

Actual

Mtrs	Rate	Amr
12000	5	72000
6000x2		

Mtrs	Rate	Amr
12670	5.70	72219

Labour.

hrs	Rate	Amr	hrs	Rate	Amr
6000	4.40	26400	6580	4.3	27950
6000x1			c	c	

variable OH.

hrs	rate	amr	hrs	rate	amr
6000	3.	18000	(6500)	3.15	20475
6000x1			c	c	

Material Cost Variance

$$72000 - 72219 = 219(\text{A})$$

material usage.

$$(12000 - 12670) \times 6$$

$$4020 (\text{A})$$

material cost

$$(6.5.70) \times 12670$$

$$380 (\text{F})$$

Labour cost - 26400 - 27950 = 1550 (A)

Efficiency
 $(6000 - 6500) \times 4.40$
 2200 (A)

late.
 $(4.40 - 4.30) \times 6500$
 650 (F).

V.O.H. cost

$$18000 - 20475 = 2475 \text{ (A)}$$

Efficiency
 $(6000 - 6500) \times 3$
 1500 A.

Expenditure
 late.

$$(3 - 3.15) \times 6500$$

975 A.

E5-2

Analysis of fixed Overhead is always based on budgeted production.

1-4-18 to 31-3-11

Step 1 f. o. variance.

unit RR exp

for understanding

30000x2 ^{unit hour}
 30000hrs

Setting standard.

2880.

HR PR Exp
 30000. 20. 600000

4 type of capacity

$30000 \times 10 \times 10 \rightarrow \text{hrs day}$
 workers.

days PR f.p.
 300 2000 600000

full capacity

24 hrs.

12 hrs.

8 hrs.

4 hrs.

2 hrs.

1 hr.

0.5 hr.

0.25 hr.

0.125 hr.

0.0625 hr.

0.03125 hr.

0.015625 hr.

0.0078125 hr.

0.00390625 hr.

0.001953125 hr.

0.0009765625 hr.

0.00048828125 hr.

0.000244140625 hr.

0.0001220703125 hr.

0.00006103515625 hr.

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fixed OH A/C

To Basic 620000 By recovery 500000
 500000×10

By under recovery 120000

620000 620000

fixed OH cost variance

$$500000 - 620000 = 120000(A)$$

$$R.O. - A.O.$$

fixed OH Exp. variance

$$B.Exp. - Actual Exp.$$

$$630000 - 620000 = 100000 A$$

fixed OH volume vari

$$B.\text{Unit} - A.\text{Unit} \times \text{PF}$$

$$60000 - 50000 \times 10$$

$$= 100000 A$$

f.o. capacity variance

$$(30000 - 32000) \times 20$$

$$(30000 - 32000) \times 20$$

$$40000 F$$

f.o. efficiency

$$\text{unit hrs.}$$

$$60000 \quad 30000$$

$$50000 \quad 25000$$

$$(B.H. - A.H.) \times \text{P.F.}$$

$$(25000 - 32000) \times 20 = 140000 A$$

$$\left(\frac{B.H. \text{ per.} - \text{Actual.}}{\text{Actual. Prod.}^n} \times \text{Recover. rate.} \right) \times \frac{\text{hrs. for.}}{\text{Actual. Prod.}^n}$$

fixed OH

Calender variance

$$(\text{no. of days})$$

f. OH required capacity

$$\text{Days hrs}$$

$$300 \quad 30000$$

$$301 \quad 30100$$

$$\left(\frac{\text{Budgeted days} - \text{Actual days}}{\text{Actual days}} \right) \times \text{Recovery rate}$$

$$(30100 - 32000) \times 20$$

$$38000 (F)$$

$$\left(\frac{\text{Budgeted hrs. in actual time}}{\text{Actual time}} - \frac{\text{Actual hrs.}}{\text{Actual time}} \right) \times \text{P.F.}$$

C.S 79

66.

fixed OH variance

~~CS 79~~

Standard P.

Aactual .

~~66~~

Unit PR Amr

Unit EXP.

30000 : 1.5 45000

32500 : 50000

Hrs PR Amr

Hrs EXP.

30000 : 1.5 45000

33000 : 52000

days PR Q EXP

days EXP.

25 1800 45000

26 50000

fixed OH. A/c

to Bank 50000

to Recovery last 48750

32500 x 1.5

to Under recovery 1250 .

fixed OH. Cost variance.

48750 - 50000 = 1250 (A)

fixed OH EXP Var.

f.OH volume var.

45000 - 50000

30000 - 32500 x 1.5

= 5000 (A) .

3250 (F)

to capacity var.

f.O. efficiency

(30000 - 32500) x 1.5

Unit hrs

4500 F

30000 30000

32500 32500

(32500 - 33000) x 1.5

750 (A)

fixed OH calendar.

Revised capacity.

(25 - 26) x 1800 .

Days hrs.

1500 f .

25 30000 .

26 31200 .

(31200 - 33000) x 1.5

~ 31200 (F) .

CG. 84

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fixed overhead.

Budget	Actual
unit	unit
PP EXP	PP EXP.
2000 2 4000	2100 100 3900

Deli. 12 R.	EXP.	Deli. EXP.
20 200 1000		19. 3900.

fixed OH A/C

To Bank	3900.	By Recovery	4200.
To over recovery	300.	2100 x 2	

fixed OH. (O) + Variance

$$4200 - 3900 = 300$$

(Recovered - Actual)

fixed OH Exp Variance

$$(4000 - 3900) \times 1000 (f)$$

$$\text{f.OH. Volume Variance} \\ (2000 - 2100) \times 2 \text{ 200(f)}$$

f.OH. capacity

$$(20 - 19) \times 200$$

$$200(A)$$

f.OH. efficiency

unit deliv.

$$2000 \quad 20 \quad (21 - 19) \times 200 \\ 2100 \quad 19 \quad 400(f)$$

1

Concept of reconciliation in Standard costing.

Steps for solving the sum.

1. Statement showing cost sheet
 2. Statement showing profit/loss A/C
 3. Statement showing reconciliation.
 4. Statement showing analysis of variance.
- # Analysis of material, labour, V.OH is always based on Actual production But Analysis of fixed overhead is based on budgeted production And
Actual profit = Actual selling price - Budgeted cost
Ex that why sales price variance is always equal to sales margin price variance.

C.S&D
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Step:-1 Statement showing cost sheet

Ans 1ii

Budget unit : 5000 unit

	Total	P4.
Dm. ($\frac{28800}{4800} \times 5000$)	30000	6
DW. ($\frac{43200}{1800} \times 5000$)	45000	9
V.C.H. ($\frac{72000}{4800} \times 5000$)	75000	15
fixed OH.	37500	7.5
Budgeted cost	187500	37.5
Budgeted profit	37500	7.5
Budgeted sales.	225000	45

Step:-2 profit & loss A/c (Given)

Actual profit = 36600

Note for exam. (library)

[Verification]

Sales price variance

$$(\textcircled{45} - 46.40625) \times 4800 = 6750 (\text{f})$$

[OR]

Actual sales: 222750

Sales price variance
6750 (f)

Standard value
for Actual sales

~~Actual~~ - ~~Standard~~

$$\text{AQ} \times \text{SR} = \text{SV}$$

$$4800 \times \textcircled{45} = 216000$$

Step. 3.

Statement showing reconciliation.

Profit as per cash sheet

37500.

Due to material

(usage variance)

(600)

Rate variance.

(300.)

Due to labour

Efficiency variance

(2200) *

Rate variance

750.

Due to V.O.H

Efficiency variance

(3750)

Exp variance

3000

Due to fixed OH.

Expenditure variance

(1500)

Volum. variance

(1500)

Due to sales margin variance

Volume variance

(1500)

Rate variance.

6750

Profit as per P/L A/c

@ 36600.

Verification.] OR

Actual SP P.U = 46.40625

Sales price value (f). 1.40625

 $(6750 \div 4800)$ standard price 45

Step 4. Analysis of variance.

Material variance : Actual production. 4800 unit

Standard

Actual

kg	Rate	Amr
	25/kg	28800

kg	Rate	Amr
	29/kg	29700

Labour variance

hrs	Rate	Amr
9600	4.50	43200

hrs	Rate	Amr
10100	4.43	44700

V.OH.

hrs	Rate	Amr
9600	7.50	72000

hrs	Rate	Amr
10100	7.2	72700

fixed OH.

Budget

unit	PR.	Exp
5000	7.5	37500
4800	2F	Exp.

Actual

unit	Exp
4800	39000
hrs	Exp
	39000

Sales margin variance Actual.

unit	Rate	Amr
5000	7.5	37500
4800	8.75	42750

Material Cost variance

(~~28800~~) - 29700 = 900 (A)

Material usage variance

Material Rate variance

900 (A)

900 (A)

Labour cost variance

(43200) - 44700 = 1500 (A)

Labour efficiency variance

(9600 - 10100) x 4.5

1500 (A)

Labour rate variance

(~~7.50~~ - ~~7.20~~)

(4.50 - 4.43) x 10100

750 (F)

V.OH. variance

750 A.

$$(7200 - 72750) = 72750$$

$$\text{V.OH Efficiency} \\ (9600 - 10100) \times 7.5$$

3750 (A)

V.OH exp. variance

$$(7.5 - 7.2) \times 10100$$

3000 F

fixed OH.

To Bank

39000

By Recovery

36000

$$4800 \times 7.5$$

By under recovery. 3000

fixed OH. cont variance.

$$36000 - 39000 = 3000 A.$$

fixed OH exp variance

fixed OH. volume var.

$$(37500 - 39000)$$

$$(5000 - 4800) \times 7.5$$

1500 (A)

1500 (A)

Sales margin variance

$$97500 - 112750 = 5250 f.$$

Sales margin volume variance

Sales margin Price variance

$$(5000 - 4800) \times 7.5$$

$$(7.5 - 8.70625) \times 4800$$

1500 (A)

6750 . (f).

Note Actual SP.

$$922750 \div 4800 = 46.40625$$

Budgeted cost

37.5

Actual prod.

8.70625

Page No. 21
Date: youva

1.00 Assume unit cost
Production 10000 units
Total cost 120000

Ques. If budgeted & actual production is not given.

Step-1 Statement showing cost sheet

		Budgeted prodn. 10000 unit
	Total	PU.
DM	200000	20 5kg x 40
DL	60000	6 2hrs x 3.
fixedOH	40000	4 <u>180000</u> <u>120,000</u>
Budgeted cost	300000	75 30
Budgeted profit	100000.	(10) <u>30 x 25</u> <u>75</u>
Budgeted sales	400000.	100 40

Step-2 Statement showing analysis of profit & loss for April 2012.

Panthenal's	Qty	Date	Amt
(1) Sales	9600.	41	393600.
(2) of sales - D.M.			203360.
D.L			57600.
fixed OH.			38600.
Total cost			299560.
Profit			94040.

Step 3. Recomputation which is (given)

Step 4. Analysis of variance

Material variance Actual production 9600 units

Standards

Actual

	Kg	Rate	dmr		Kg	Rate	dmr
	48000	4	192000		49600	4.10	203360
	9600 x 5						

Labour variance

	hr	Rate	dmr		hrs	Rate	dmr
	19200	3	57600		18000	3.2	57600
	9600 x 2						

fixed overheads.

Budget A

Actual

	Unit	R.P.	Exp		Unit	Exp.
	10000	4	40000		9600	38600
	hrs	PR	Exp		hrs	Exp.
	1.20000	2	40000		18000	38600
	10000 x 2					

Sales margin variance

	Unit	Rate	dmr		Unit	Rate	dmr
	10000	10	100000		9600	11	105600

Actual sales price 41

- Budgeted cost $\frac{30}{11}$

Material Cost Variance

$$(192000 - 203360) = 11360 A.$$

M. usage variance

$$(48000 - 49600) \times 4 = 6400 F.$$

M. Price variance

$$(4 - 4.10) \times 49600 = 4000 F$$

Labour cost variance

$$(57600 - 57600) = 0.$$

L. Efficiency variance

$$(19200 - 18000) \times 3 = 3600 F$$

L. Rate variance

$$(3 - 3.2) \times 18000 = 3600 A$$

fixed OH A/c

To Bank 38600.

By Recovery, Rate 38400
9600 $\times \frac{1}{4}$ -

By under recovery \$ 200

fixed OH (cost variance)

$$(38400 - 38600) = 200 A.$$

fixed OH. Exp. V.

$$(40000 - 38600) =$$

f.OH volume

$$(10000 - 9600) \times 4$$

$$1600 A$$

$$1400 F.$$

fixed capacity

$$(20000 - 18000) \times 2$$

$$4000 A$$

efficiency

$$\frac{1}{10000 - 20000} (19200 - 18000) \times 2$$

$$9600 - 19200$$

$$2400 F.$$

Sales margin variance

$$(100000 - 105600) 5600 F$$

S.m. volume variance

$$(10000 - 9600) \times 10$$

$$4000 A$$

S.m. price variance

$$(10 - 11) \times 9600$$

$$9600 F$$

~~CS 81~~
~~PGF~~

Step - 1 Statement showing Cost sheet

Budgeted profit of 1000

Total

PU.

Sales	6000	0.25
V.C.		
material	(960)	0.04
labour	(1440)	0.06
v.OH.	(2400)	0.10
Budgeted Contribution	1200	0.05

Step 2. Statement showing Profit £ 100.

Actual unit of 5600:

Sales.	6784
- V.COST	
material	1080
labour	1664
v.OH.	2592
Contribution	1448

Statement showing reconciliation part

Profit as per cost sheet 1200.

Due to material.

Usage	(128)
Rate	+2

Due to labour

Efficiency	(24)
late	(104)

Due to V.C.H.

Efficiency	(40)
late/exi	8

Due to Sales margin.

Volume	50
late	384

Profit as per plc 1448

Ques b. Analysis of variance :- material : 25600.

standard

Actual

kg	Rate	Amur	kg	Rate	Amur
128	8	1024.	144	7.50	1080
		$\frac{960}{128} \times 25600$			given

Labour :

hrs	Rate	Amur	hrs	Rate	Amur
256.	6	1536	260	6.4	1664
		$\frac{1440}{256} \times 25600$			given

V.OH

hrs	Rate	Amur	hrs	Rate	Amur
256	10.	2560.	260	9.97	2592.
		$\frac{2400}{256} \times 25600$			

Sales margin variance

Unit Sales	Amur	Unit Sales	Amur
24000. .05	1200.	25600. 0.065	1664

material cost variance

$$1024 - 1080 = 56 (\text{A})$$

material usage

$$(128 - 144) \times 8$$

$$128 (\text{A})$$

material rate

$$(8 - 7.50) \times 144$$

$$72 (\text{F})$$

Labour cost variance

$$1536 - 1664 = 128 (\text{A})$$

Efficiency

$$(256 - 260) \times 6 = 24 \text{ A.}$$

Rate

$$(6 - 6.4) \times 260$$

$$104 (\text{A})$$

V.OH. (OVR)

$$(2560 - 2592) = 32 (\text{A})$$

Rate / Exp.

$$(10 - 9.97) \times 260$$

$$2.2 \times 2.2$$

Efficiency

$$(256 - 260) \times 10$$

in F.

Sales margin variance
 $1200 - 1664 = 464 \text{ f.}$

Sales margin

s.m.

volume variance

$$(24000 - 25600) \times 0.05$$

~~800~~ 0 800

80 f

Rate variance

~~(0.05 - 0.0625)~~

$$(0.05 - 0.065) \times 25600$$

384 ~~8~~ (f)

$$\text{Actual S.P.} = 6784 / 25600 = 0.265$$

- Budgeted Com

0.200

0.265

Ans b

Sales margin volume 80 f

Due to market size
variance

Due to market share
variance

Budget mkt size - Actual mkt size

$$(20000 - 24000) \times 12\% \times 0.05$$

240 (f).

~~24000~~

12%

Budgeted share in
actual size

Actual share

in actual

size

size

$$28800 - 25600 \times 0.05$$

$$24000 \times 12\%$$

160 (A)

Q8.

CS86

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Step 1 Statement showing cost sheet

Budgeted Prodⁿ: 200000.

	Total	Unit
Sales	2100000	10.5
- variable cost	(1266000)	6.33
Contribution	834000	4.17
fixed cost	(315000)	1.575
	519000	2.595

Step 2 St. sh. profit / loss analysis of P/L

(A) Sales	1690900
(B) V. cost	1071150
Contribution	618850
fixed cost	330000
Profit	288750

Step 3 Reconciliation statement

Profit as per cost sheet	519000
Due to variable OH.	0
Expenses / rate total	(29700)

Due to sales margin.

volume	(145950)
price	(39600)
Due to f. OH. (315000 - 330000)	(15000)

Profit on per P/L 288750

Step - 4 Analysis of variances:

Material Varial Actual Prod 165000.

Standards

unit	Rate	dmr
165000	6.33	1044450
		$\frac{12.66 \text{ rate}}{20000 \text{ units}} \times 165000$

Actual

unit	Sale	dmr
165000	6.51	1071150

Sales margin variance.

units	rate	dmr
200000	6.33	125000
4.17	8.34000	

units	rate	dmr
165000	3.93	648450

Actual margin P.U.

Actual Sales P.U. 10.26

$1692900 / 165000$

- Budgeted P.U. 6.33

3.93

variable cost variance

$$(1044450 - 1071150) = -27700 \text{ (A)}$$

variable volume

efficiency

$$(165000 - 165000) \times 6.33$$

V.C EXP

$$(6.33 - 6.51) \times 165000$$

0

20700 (A)

Sales margin variance

$$\cancel{3.93} - 6.48450 = -235550$$

$$834000 - 648450 = 185550. \text{ (A)}$$

volume variance

$$(200000 - 165000) \times 4.17$$

145950 (A)

price Variance

$$(4.17 - 3.93) \times 165000$$

39600 (A)

Sales margin volume. 145950 (A)

Due to

Market size.

Pw. to

Market share.

$$(2100 \text{ CAC} - 375000) \times 4.17 \times \frac{200000}{400000}$$

~~25000 x 4.17~~

= ~~500000~~ : 52125 (P)

$$(187500 - 165000) \times 4.17$$

~~375000 x 50%~~

93825 (A).

200000 = 25000

100000 = 12500

100000 = 12500

Accounting methods.

factory

non integrated



Cost control / GLA A/c

↓

Head office



Integrated.



Cash / Bank

Debtors / creditors

Production, Budget production 11000 units - S1
cost sheet

p.u.

D.C.O.F

DM (10kg x 10) 100.

DL (10hr x 10) 100

Indirect COF

factory off $\frac{11000}{1100}$ 10

factory com 210

Profit 90

Sp. 300

Actual production : 1000 units. :- material.

Standards

kg	Rate	Amt
10000	10	100000
1000×10		

Actual.

kg	Rate	Amt
11000	11	121000

Labour :

hrs	Rate	Amt
10000	10	100000
1000×10		

hrs	Rate	Amt
11000	11	121000

f.C.H

Budget

unit	RR.	exp.
1100	10	11000

Actual.

unit	exp.
1000	12000

Plans.

Partial
plan

Single
plan.

Partial plan :- As per this plan we will debit the WIP A/c on the basis of actual & credit the same on the basis of Standards & Analysis of variance take place at the end of the year or period

Partial plan / Books H.O.

Particulars

Material Control A/c	121000	Dr. 121000
Labour Control A/c	121000	
OH Control A/c	12000	
To Cash / Bank A/c	254000	
WIP control A/c	251000	
To Material control	121000	
To Labour control	121000	
To OH control	12000	
-finished Goods control A/c	210000	
To WIP control	210000	

Analysis of variance

1) Material cost variance

$$(10000 - 11000) \times 10 = -10000 \text{ A}$$

Usage

$$(10000 - 11000) \times 10 = -10000 \text{ A}$$

$$10000 \text{ (A)}$$

$$= 11000 \text{ (A)}$$

Rate

$$2) Labour cost variance (10000 - 121000) = -21000 \text{ (A)}$$

Efficiency

$$(10000 - 11000) \times 10 = 10000 \text{ (A)}$$

Rate

$$3) fixed OH cost variance (10000 - 12000) = -2000 \text{ (A)}$$

Expense

$$\frac{(11000 - 12000)}{(11000 - 12000)} = 1000 \text{ A}$$

Volumne

$$\frac{(11000 - 1000)}{(11000 - 1000)} \times 10 = 1000 \text{ A}$$

Material usage variance Dr	10000
" Rate " Dr	11000
Labour efficiency variance Dr	10000
" Rate " Dr	11000
fixed OH exp. variance Dr	1000
volume. " Dr	1000
To WIP control	14000

Single plan :- As per this plan we will debit the material account, labour account, variable OH account, fixed OH account, WIP account, finished goods account on the basis of standard & credit the same. On the basis of standard & analysis of various take place as whenever the transaction takes place.

Single plan HC.

(1) Material control A/c Dr 110000
 11000×10

Material rate v. A/c 11000
 $(10-11) \times 11000$

To cash/bank 121000.

(2) WIP control A/c Dr 100000.
 $(1000 \times 10) = (10000 \times 10)$

Material usage v. Dr 10000
 $(10000 - 11000) \times 10$

To material control 110000

① Labour Control A/c Dr 11000/-
11000 x 10

Labour rate variance DR (10-11) x 11000 11000
To cash / Bank 121000

② WIP Control A/c Dr 10000/-
1000 x 10 = 10000 x 10

Labour efficiency Variance A/c 10000/-
(10000 - 11000) x 10

To Labour Control A/c 11000

③ fixed OH control A/c Dr 11000/-

fixed Expenses variance A/c DR 1000/-
(11000 - 12000),

To cash / Bank 12000/-

WIP const A/c DR . (1000 x 10) 10000/-

fixed OH Volume Variance DR 1000/-
(1100 - 1000) x 10.

To f. OH control 11000/-

finished Goods A/c DR 21000/-

To WIP Control 21000/-
1000 x 210.

CS 82 A

6.9 Single Plan

Step(1) material variance

Actual production: 2000 units

Standards:

Actual

	Kg	Rate	Amur		Kg	Rate	Amur
A	20000	5	100000		18900	5.25	99225
B	20000 × 10						
B	10000	6	60000		10750	5.7	61275
	20000 × 5						
	30000		160000		29650		160350

Labour variance

hrs	Rate	Amur	hrs	Rate	Amur
10000	5	50000	10500	4.8	50400
20000 × 5			10300		

fixed OH

unit	RF	Exp.	unit	Exp
2000	25	52500	2000	56600
25200	12			

Sales margin

unit	Rate	Amur	units	Rate	Amur
2100	35	73500	2000	35	70000

Actual SP: 225

Budget CO: 190

35 Variable OH.

hrs	Rate	Amur	hrs	Rate	Amur
10000	12	120000	10300	11.16	115800
20000 × 5					

Ans No 1. Analysis of variance. As per single plan.

take at two time of purchase.

Material rate variance

$$A (5 - 5.25) \times 20000 = 5000 \text{ A}$$

$$B (6 - 5.70) \times 11500 = 3450 \text{ (F.)}$$

Material usage variance

$$A (20000 - 18900) \times 5 = 5500 \text{ (F.)}$$

$$B (10000 - 10750) \times 6 = 4500 \text{ (A.)}$$

Labour rate variance

$$(5 - 4.80) \times 10500 = 2100 \text{ (F.)}$$

Labour efficiency variance

$$(10000 - 10300) \times 5 = 1500 \text{ (A.)}$$

Labour Ideal time

$$200 \times 5 = \cancel{1000} \rightarrow 1000 \text{ (A.)}$$

fixed OH. Exp variance

$$(52500 - 56600) = 4100 \text{ (A.)}$$

fixed OH. Volume variance =

$$(2100 - 2000) \times 25 = 2500 \text{ (A.)}$$

V.OH. Rate variance

$$(12 - 11.16) \times 10300 = 8600 \text{ (F.)}$$

V.OH. Efficiency variance

$$(10000 - 10300) \times 12 = 3600 \text{ (A.)}$$

Sales margin volume = 3500 (A.)

$$(2100 - 2000) \times 35$$

Sales margin rate variance 0.

$$(35 - 35) \times 2000$$

Ans ii Statement showing reconciliation.

Profit as per cost sheet : 73302.
35x100unit

Due to material rate variance

A	(500)
B	3450.

Due to material usage variance

A	550
B	(450)

b) Labour rate variance 2100

" Efficiency " (1500)

" Ideal (1000)

fixed OH exp (2100)

fixed OH volume (2500)

v.OH Rate variance 860.

Efficiency (360).

Sales volume variance (3500)

Profit as per P/L 67450

Ans - 3. St. Sh. required reconciliation.

Profit as per reconciliation 67450

Due to material A rate 275

(28000 - 18900) x 0.25

Due to material B rate

(11500 - 10750) x 0.30 (625)

Benefit

Profit as per P/L 67500

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三十一

Concept of Indian Reconciliation

Statement showing analysis of variance.

22 Laets.

P particular	31.3.16	31.3.17.	fixed ↑ ↓	var	var due to price value.	due to other.
Sales	3000.	3277.5	277.5	427.50	(150)	—
V.C.						
material	(2000)	(2357.50)	(357.50)	(307.50)	100	(150)
v.o.h.	(500.)	(525)	(25)	(25)	25	(25).
fixed(O/H)						
Conf^n.	500	395	(105)	95	(25)	(175)
fixed (cost)	(300)	(367.50)	(67.50)	(47.50)	—	(50)
Profit	200.	27.5	172.50	77.5	(25)	(225).

Note No 1)

Due to Sales

Due to police

(3277.5 - 2850)

427.5

100

15

115

3277.50.

3277.50x100

115

Q 850

Due to volume usage

(150)

(2850 - 3000)

237.50

Note .. 2

Due to material.

100 15 115

2357.50 x 100
2357.50

115 307.50

2050.

Due to per'ce.

(307.50.)

Due to volume

100

$$\frac{2000}{3000} \times 150 = 100$$

2000 min
3000 min
100 min
300 min
100 min
300 min

Due to other.

157

357.50.

Note .. 3

Due to variable OH.

Due to v.OH. (500 - 525) = (25)

100 5 105

500. 525

~~$\frac{525 - 100}{105}$~~

Due to volume $\left(\frac{5000}{3000} \times 150 \right) = 25$

Due to others (25)

(25)

Due to fixed OH. Per unit

<u>Price</u>	100.	5	105
	350.	17.5	367.50
	<u>367.5×100</u>	<u>105</u>	

f·CH	Due to price	17.5
	(350 - 367.50)	

f·OH. Due to volume. —

Due to other	<u>50</u>
	<u>67.5</u>

∴ S. SF St. Sh. Budgeted profit P.U.

	C1	C2	C3
SP (P.U.)	17600	25600	224000
- v. Price			
Dm	(8000)	(1280)	(9600)
DL	(3200)	(480)	(4800)
V.OH.	(320)	(48)	(480)
Cont ⁿ	6080.	752.	7825.

Sales margin variance.

Standards.

Actual.

Product unit	Rate	Amnt	Qty.	Rate	Amnt
C1	100/- x 6080	6080000	900.	7680	6912000
				19200 - 11320	
C2	3200 x 752	2444000.	3875	2672	2604000
				2480 - 1808	
C3	750 x 480	5640000.	975	5120	4992000
				20000 - 17880	
	5000	14164000.	5750.		14588000.

(+) Actual sales ⁺
- Budgeted (0)

8/21

Analysis of Variance

Sales margin variance

$$14164000 - 14580000$$

$$14164000 - 14580000 = 344000 \text{ (F)}$$

Sales margin volume

$$(1) (1000 - 900) \times 6080 = 608000 \text{ (A)}$$

$$(2) (3250 - 3875) \times 752 = 470000 \text{ (F)}$$

$$(3) (750 - 975) \times 7520 = 1692000 \text{ (F)}$$

1554000 (F)

Sales margin Price

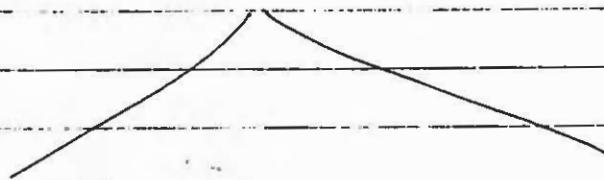
$$(6080 - 7680) \times 900 = 1440000 \text{ (F)}$$

$$(752 - 672) \times 3875 = 310000 \text{ (A)}$$

$$\cancel{(7520 - 5120) \times 975}$$

$$(7520 - 5120) \times 975 = 2340000 \text{ (A)}$$

1210000 (A)



Sales margin Subvolume

$$(5000 - 5750) \times 14164000$$

850

= 2104600 (F).

$$(1) \left(\frac{1000}{5000} \times 5750 \right) = [1150 - 900] \times 6080$$

= 1520000 (A)

$$(2) \left(\frac{3250}{5000} \times 5750 \right) = [3737.5 - 3875] \times 752$$

103400 (F)

$$(3) \left(\frac{750}{5000} \times 5750 \right) [862.5 - 975] \times 7520$$

846000 (F)

570600 (A)

CHAPTER - 10

STRATEGIC ANALYSIS OF OPERATING INCOME (Activity Based Costing)

Meaning of Activity Based Costing —

It is a modern approach for recovery of O&H's which is based on activity cost and their cost drivers.

Steps for solving —

Step 1 Statement showing cost driver rate.

Step 2 Statement showing cost driver rate per unit per product.

Step 3 Statement showing cost sheet as per ABC.

Step 4 Statement showing comparative cost sheet.

Step 5 Comments.

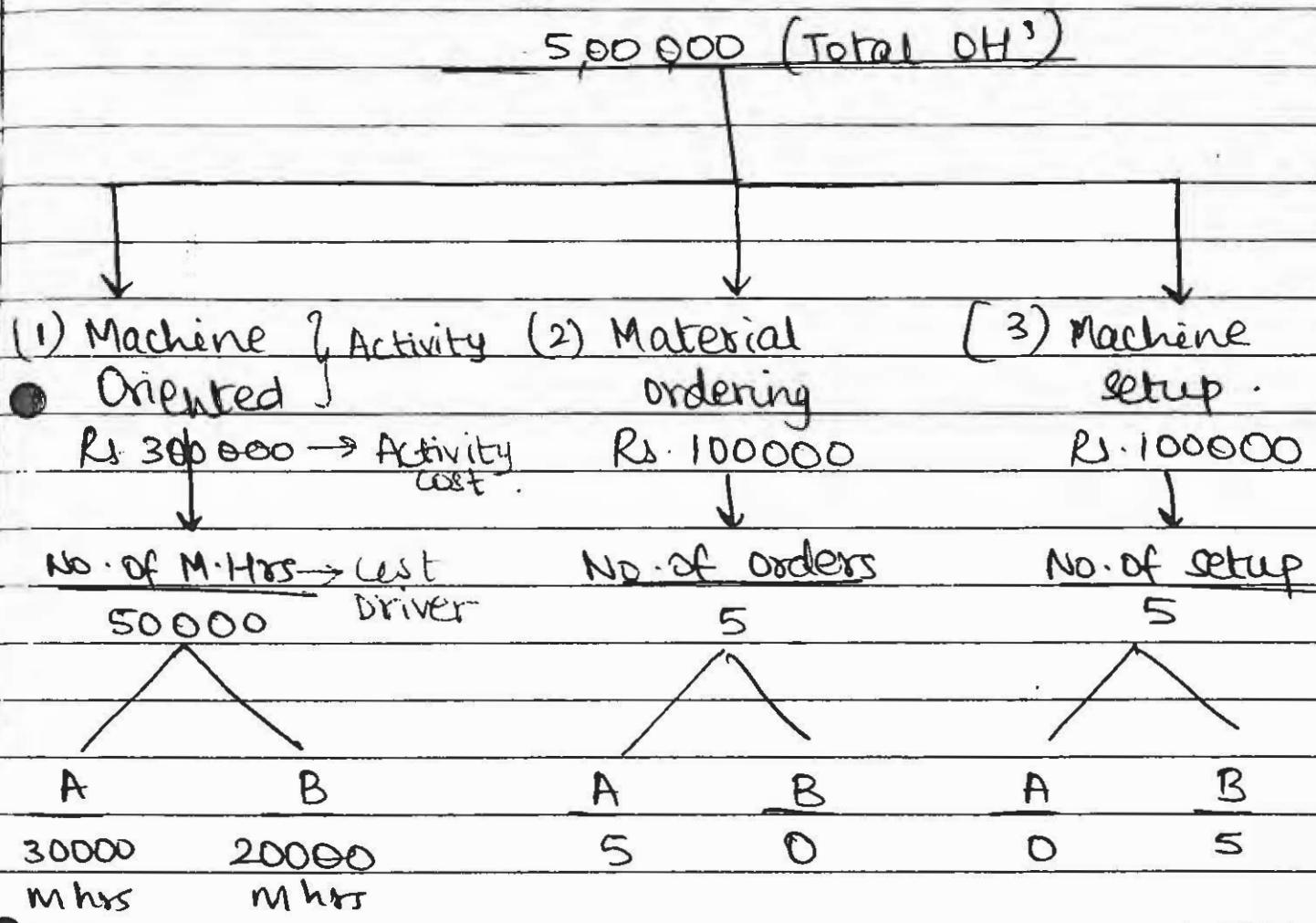
CASE STUDY AS PER TRADITIONAL METHOD:

<u>Product Mat p.u</u>	<u>Lab p.u</u>	<u>M.Hrs</u>	<u>Units</u>
A	2	2	30000
B	2	2	20000
<u>M.Hrs</u>	<u>R.R</u>	<u>OHS</u>	
50,000	10	500,000	

Statement Showing Cost Sheet (As per traditional method) (₹)

<u>Products</u>	<u>A</u>	<u>B</u>
Prodn.	30,000 p.u	20,000 p.u
<u>DIRECT COST</u>		
Direct Mat	2	2
Direct Lab	2	2
<u>PRIME COST</u>	4	4
<u>INDIRECT COST</u>		
Fixed OHS	10	10
<u>units</u>		
<u>M.Hrs</u> ← $(M.Hrs \times R.R) (1 \times 10)$		
= $\frac{30000}{2}$		
$\Rightarrow 30000$		
$\Rightarrow 1 \text{ hr.}$		
$\Rightarrow 30000 \text{ p.u.}$		
<u>FACTORY COST</u>	<u>14</u>	<u>14</u>

CASE STUDY AS PER MODERN METHOD (ABC) :



Step 1

Statement showing Cost Driver Rate

$$\text{Activity} \quad \text{Cost Driver} \quad \frac{\text{Activity Cost}}{\text{Cost Driver}} = \text{Cost Driver Rate}$$

$$(1) \quad \begin{array}{l} \text{Machine} \\ \text{Oriented} \end{array} \quad \begin{array}{l} \text{No. of} \\ \text{M-Hrs} \end{array} \quad \left(\frac{300000}{50000} \right) = \text{Rs. } 6$$

$$(2) \quad \begin{array}{l} \text{Material} \\ \text{Ordering} \end{array} \quad \begin{array}{l} \text{No. of} \\ \text{orders} \end{array} \quad \left(\frac{100000}{5} \right) = \text{Rs. } 20000$$

$$(3) \quad \begin{array}{l} \text{Machine} \\ \text{setup} \end{array} \quad \begin{array}{l} \text{No. of} \\ \text{setup} \end{array} \quad \left(\frac{100000}{5} \right) = \text{Rs. } 20000$$

Step 2

Statement showing cost driver rate p.u per product

$$\text{Activity} \quad \text{Products} \quad \text{Cost Driver used} \times \frac{\text{Cost Driver}}{\text{Prod.}} = \frac{\text{Cost Driver Rate}}{\text{P.U.P.P.}}$$

$$\begin{array}{lll} \text{Machine} & A & 30000 \times 6 \\ \text{oriented} & & 30000 \end{array} = \text{Rs. } 6.$$

$$\begin{array}{lll} B & & 20000 \times 6 \\ & & 20000 \end{array} = \text{Rs. } 6.$$

$$\begin{array}{lll} \text{machine} & A & 5 \times 20000 \\ \text{ordering} & & 30000 \end{array} = \text{Rs. } 3.33$$

$$\begin{array}{lll} \text{machine} & B & 5 \times 20000 \\ \text{setup} & & 20000 \end{array} = \text{Rs. } 5$$

Step 3

Statement showing cost sheet as per ABC
(2)

Products	A	B
Units	30000 p.u.	20000 p.u.

DIRECT COST

Direct Mat	2	2
Direct Lab	2	2
PRIME COST	4	4

INDIRECT COST

fixed OH's		
Activity (1)	6	6
(2)	3.33	—
(3)	—	5
FACTORY COST	13.33	15.

Step 4

Statement showing comparative cost sheet

Traditional ABC

A	14	13.33
B	14	15

Step 5

Comments :

The above analysis clearly shows that the cost p.u as per ABC is more accurate and reliable than traditional method. So company should follow the modern method (ABC) for recovery of OH's to get the correct cost and maximum profit.

Step 1

statement showing Cost Driver Rate :

Activity	Cost Driver	$\frac{\text{Activity Cost}}{\text{Cost Driver}}$	Cost Driver Rate
----------	-------------	---	------------------

(1) Mach Oriented	M. Hrs (1)	$\frac{149700}{49900}$	3.
-------------------	------------	------------------------	----

(2) Mat. Order	No. of orders (3+12+3+12)	$\frac{7680}{30}$	256
----------------	------------------------------	-------------------	-----

(3) Set up	No. of setup (3+18+5+24)	$\frac{17400}{50}$	348
------------	-----------------------------	--------------------	-----

(4) OH ^s for Spares	No. of Spares (6+15+3+12)	$\frac{34380}{36}$	955
--------------------------------	------------------------------	--------------------	-----

(5) Mat Hand.	No. of times (6+30+9+36)	$\frac{30294}{81}$	374
---------------	-----------------------------	--------------------	-----

① No. of M-Hrs

Products	Units	x hrs p.u	= Total
P	1000	x 0.50	500
Q	10000	x 0.50	5000
R	1200	x 2	2400
S	14000	x 3	42000
			<u>49900</u>

I] Step 2

Statement showing Cost driver rate p.u per prod

Activity Product Cost Driver \times Cost Driver \div Prod'n = Cost Driver Rate p.u p.p.

Mach Orient	P	$\$ 500 \times 3 \div 1000 = 1.50$
	Q	$5000 \times 3 \div 10000 = 1.50$
	R	$2400 \times 3 \div 1200 = 6$
	S	$42000 \times 3 \div 14000 = 9$

Mat Order	P	$3 \times 256 \div 1000 = 0.77$
	Q	$12 \times 256 \div 10000 = 0.31$
	R	$3 \times 256 \div 1200 = 0.64$
	S	$12 \times 256 \div 14000 = 0.22$

Set up	P	$3 \times 348 \div 1000 = 1.04$
	Q	$18 \times 348 \div 10000 = 0.63$
	R	$5 \times 348 \div 1200 = 1.45$
	S	$24 \times 348 \div 14000 = 0.59$

SH ³ for SP	P	$6 \times 955 \div 1000 = 5.73$
	Q	$15 \times 955 \div 10000 = 1.43$
	R	$3 \times 955 \div 1200 = 2.39$
	S	$12 \times 955 \div 14000 = 0.82$

Mat Hand	P	$6 \times 374 \div 1000 = 2.24$
	Q	$30 \times 374 \div 10000 = 1.12$
	R	$9 \times 374 \div 1200 = 2.81$
	S	$36 \times 374 \div 14000 = 0.96$

II

Step 3

Statement showing cost sheet as per ABC
(Rs)

Products	P	Q	R	S
Units	1000	10000	1200	14000
	P.U	P.U	P.U	P.U
<u>DIRECT COST</u>				
Dir Mat	10	10	32	34
Dir Lab	6	6	4	18
① PRIME COST	<u>16</u>	<u>16</u>	<u>36</u>	<u>52</u>
<u>INDIRECT COST</u>				
Fixed OHS				
Activity	1	1.50	1.50	6
	2	0.77	0.31	0.64
	3	1.04	0.63	1.45
	4	5.73	1.43	2.39
	5	<u>2.24</u>	<u>1.12</u>	<u>2.81</u>
②	11.28	4.99	13.29	11.59
FACTORY COST ①+②	27.28	20.99	49.29	63.59

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Step 1

Statement showing cost driver Rate.

Activity	Cost Driver Prodears	Activity Cost	=	Cost Driver Rate
Stores Recv	No. of pur requisition	296000 300+450+500	=	236.80
Insp.	No. of prodn runs	894000 750+1050+1200	=	29.8 290000
Dispatch	Orders executed	210000 180+270+300	=	280
Machine Setup	No. of setups	1200000 360+390+450	=	1000

Step 2

Statement showing cost driver rate p.u per product

Activity

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Step 1

Statement showing Cost Driver Rate

Activity	Cost Driver	Activity Cost = Cost Driver Cost Driver	Rate
ATM Service	ATM Trans.	$\frac{100000}{180000 + 0 + 20000}$	= 0.50

Comp Prod.	Comp Trans.	$\frac{1000000}{2500000}$	= 0.40
------------	-------------	---------------------------	--------

Iss St ^M	No. of St ^F	$\frac{800000}{500000}$	= 1.60
---------------------	------------------------	-------------------------	--------

Cust Inv	Tel Mins	$\frac{360000}{600000}$	= 0.60
----------	----------	-------------------------	--------

Step 2

Statement showing cost of each product

Products	Checking A/c	Personal Loan	Credit Visa
ATM Services	90,000	—	10,000
	($180,000 \times 0.50$)		($20,000 \times 0.50$)
Comp Process	800,000	80,000	120,000
	($2,000,000 \times 0.40$)	($200,000 \times 0.40$)	($300,000 \times 0.40$)
Iss St.	480,000	80,000	240,000
	($3,000,000 \times 1.60$)	($50,000 \times 1.60$)	($150,000 \times 1.60$)
West Ing	210,000	54,000	96,000
	($350,000 \times 0.60$)	($90,000 \times 0.60$)	($160,000 \times 0.60$)
	<u>158,000,00</u>	<u>214,000</u>	<u>466,000</u>

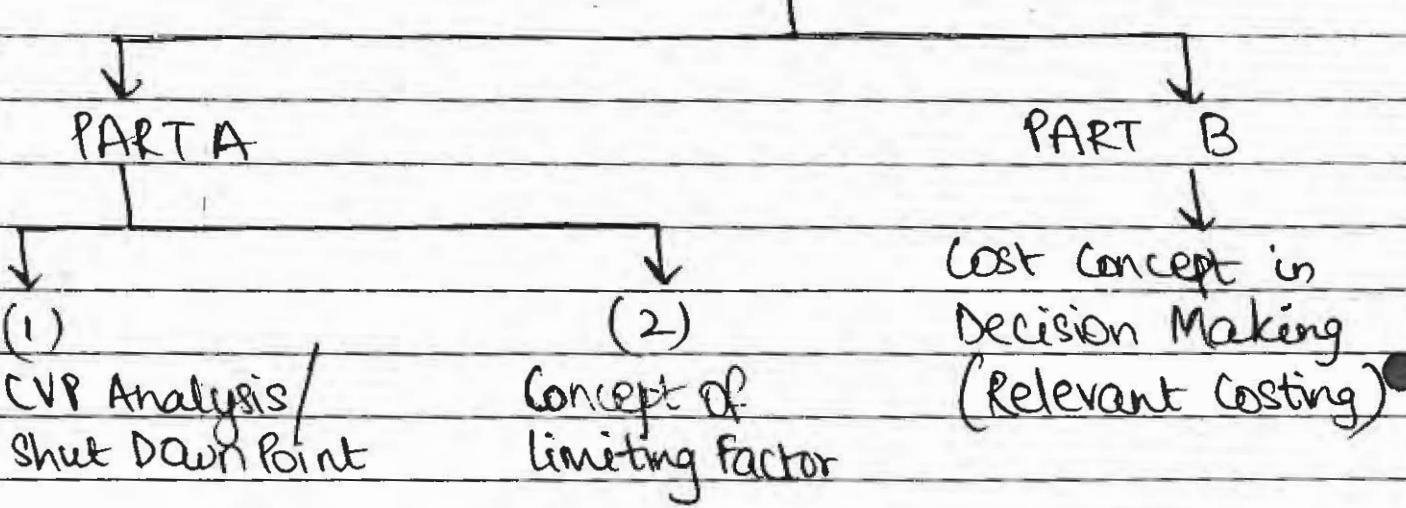
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Statement showing customer profitability
Analysis of P/L as per ABC.

	A	B	C	D
NO. OF UNITS	60000	80000	100000	70000
REVENUE				
Sales	15000	18400	21000	15400
	(60000 × 0.25)	(80000 × 0.23)	(100000 × 0.21)	(70000 × 0.22)
0) (-) RELEVANT COST				
(1) Sales Visit	(420)	(840)	(1260)	(630)
	(2 × 210)	(4 × 210)	(6 × 210)	(3 × 210)
(2) Order place	(1800)	(1200)	(2400)	(1200)
	(30 × 60)	(20 × 60)	(40 × 60)	(20 × 60)
(3) Prod Hand	(6000)	(8000)	(10000)	(7000)
	(60000 × 0.10)	(80000 × 0.10)	(100000 × 0.10)	(70000 × 0.10)
(4) Nor Del	(400)	(900)	(500)	(1400)
	(10 × 2 × 20)	(15 × 2 × 30)	(25 × 2 × 10)	(14 × 2 × 50)
(5) Rush Del	-	-	(200)	(400)
			(1 × 200)	(2 × 200)
DIRECT PROFIT	<u>6,380</u>	<u>7,460</u>	<u>6,640</u>	<u>4,770</u>

DECISION MAKING

Decision Making



CHAPTER

10

STRATEGIC ANALYSIS OF OPERATING INCOME



~~Illustration~~ 10.10

- Jigyasa India Ltd. (JIL) has 30 retail stores of uniform sizes 'Fruity & Sweety Retails' across the country. Mainly three products namely 'Butter Jelly', 'Fruits & Nuts' and 'Icy Cool' are sold through these retail stores. JIL maintains stocks for all retail stores in a centralised warehouse. Goods are released from the warehouse to the retail stores as per requisition raised by the stores. Goods are transported to the stores through two types of vans i.e. normal and refrigerated. These vans are to be hired by the JIL.

Costs per month of JIL are as follows:

10.10	
Warehouse Costs:	
Labour & Staff Costs	27,000
Refrigeration Costs	1,52,000
Material Handling Costs	28,000
Total	2,07,000
Head Office Cost:	
Salary & Wages to Head Office Staff	50,000
Office Administration Costs	1,27,000
Total	1,77,000
Retail Stores Costs:	
Labour Related Costs	33,000
Refrigeration Costs	1,09,000
Other Costs	47,000
Total	1,89,000

Average transportation cost of JIL per trip to any retail stores are as follows:

Normal Van	₹3,200
Refrigerated Van	₹4,900

The Chief Financial Manager asked his Finance managers to calculate profitability based on three products sold through Fruity & Sweety retail stores rather than traditional method of calculating profitability

10.15

The following information regarding retail stores are gathered:

	Butter Jelly	Icy-Cool	Total
No. of Cartons per cubic metre (m^3)	42	28	40
No. of Items per cartons (units)	300	144	72
Sales per month (units)	18,000	4,608	1,152
Time in Warehouse (in months)	1	1.5	0.5
Time in Retail Stores (in months)	1	2	1
Selling Price per unit (₹)	84	42	26
Purchase Price per unit (₹)	76	34	22

Butter Jelly and Icy-Cool are required to be kept under refrigerated conditions.

Additional information:

Total Volume of All Goods Sold per month	40,000 m^3
Total Volume of Refrigerated Goods Sold per month	25,000 m^3
Carrying Volume of each van	64 m^3

Required

CALCULATE the Profit per unit using Direct Product Profitability (DPP) method.

10.16

~~FULL
10/10~~

Page No.

Date

STATEMENT SHOWING DIRECT Product Profitability (D.P.P.)

	BUTTER JELLY	FRUITS NUT	ICY COOL
SELLING PRICE (P.U)	(P.U)	(P.U)	(P.U)
= 84	+ 42	= 26	
PURCHASE PRICE	(76)	(34)	(22)
GROSS PT	8	8	4
DIRECT - PRODUCST			
(1) WAREHOUSE COST per m ³ (NOTE NO 1)	= 7.46	= 2.07	= 3.73
(2) RETAIL-STOCK-COST per m ³ (NOTE-2)	= 6.36	= 4	= 6.36
(3) TRANSPORT-COST per m ³ (NOTE NO 3) COST PER UNIT.	= 76.56 90.38 + 126.00 = .007	= 50 56.07 - 4032 = .014	= 76.56 86.65 - 2880 = .03
DIRECT - PRODUCT	7.993 (8-.007)	56.07 = 7.986 (8-.014)	3.97 (4-.030)

	STATEMENT SHOWING NO OF ITEMS PER m ³
NO OF CARTONS	BUTTER JELLY FRUITS NUT ICY-COOL 42 28 40
X NO OF ITEMS	X 300 X 144 X 72
NO OF ITEMS PER m ³	= <u>12600</u> = <u>4032</u> = <u>2880</u>

NOTE NO(1) WAREHOUSE RECATED COST - P.M - MONTH

	BUTTER JELLY	FRUITS & NUTS	ICY COOL.
<u>WAREHOUSE</u>			
(1) GEN-COST (P.M) (NOTE NO 4)	1.38×1 = 1.38	$1.38 \times 1.5 = 2.07$ = 2.07	$1.38 \times 1.5 = 2.07$ = 2.07
(2) COST RELATED WITH REF (P.M) (NOTE NO 3)	6.08×1 = 6.08	-	3×6.08 = 3.04
ITEMS m ³	7.46	2.07	37.2
	$\div 1000$	2.07	37.2
	0.00746	0.00207	0.00372
NOTE NO 4 GEN COST	COST TO REF		
	\downarrow		

WAREHOUSE

Labour STAFF	27000	-
REF COST	-	152000
MHAND	28000	
	<hr/>	
	55000	152000
	$\div 40000$	$\div 25000$
	$= 1.375$	$= 6.08$
	$@ 1.38$	

NOTE NO-2	BUTTER JELLY	FRUITS/NUTS	ICY COOL
RETAIL STORES			
GEN COST (NOTE NO 6)	2.00×1	2.00×2 = 4	2.00×1
COST RELATED WITH REF. 4.3(XI)	4.36	4.36	4.36×1
	6.36	6.36	6.36

10.18

	COST	COST PER
Labour Cost	33000	-
Ref- cost		109000
Other Cost	47000	
	80000	109000
	÷ 40000	÷ 25000
	= 2.00	4.36

NOTE NO(3) TRANSPORT-COST

	NORMAL VAN	REF VAN
COST PER (TRIP)	3200	4900
VOLUME	64	64
COST PER TRIP	50.00	76.56
	÷ 400000	÷ 25000
	10.19	
	BUTTERFLY PER UNIT	COT-COT
	10.19	

Illustration

A and B are two customers of XYZ Electronics Ltd., a manufacturer of audio players. Selling price per unit is ₹5,400. Its cost of production per unit is ₹4,420.

Additional costs are:

Order Processing Cost..... ₹2,000 per order

Delivery Costs..... ₹3,500 per delivery

Details of customers A and B for the period are given below:

	Customer A	Customer B
Audio Players purchased (nos.)	350	500
No. of orders	5 (each of 70 units)	10 (each of 50 units)
No. of deliveries	5	0

The company's policy is to give a discount of 5% on the selling price on orders for 50 units or more, and to further give 8% discount on the undiscounted selling price if a customer uses his own transport to collect the order. Assume that production levels are not altered by these orders.

Required

- (i) ANALYSE the profitability by comparing profit per unit for each customer.
- (ii) COMMENT on the discount policy on delivery.

10.20

STATEMENT SHOWING ANALYSIS OF PLANS

	CUSTOMER-A	CUSTOMER-B
SACF UNITS 10.14	350	500
S.P (P.U)	Rs 5400	Rs 5400
QTY - DISCOUNT $(5400 \times 5\%)$	(270) $(5400 \times 5\%)$	(270) $(5400 \times 5\%)$
DISCOUNT - DELIVERY	-	(432) $(5400 \times 8\%)$
NET-SELLING PRICE	5130	4698
V.COST - (P.U)	(4420)	(4420)
	710	278
TOTAL CONTRIBUTION (UNITS X CONC P.U)	= 248500 (350×710)	= 139000 (500×278)
INDIRECT COST		
(1) DELIVERY COST (5×3500)	(17500)	-
(2) ORDERING COST (5×2000)	(10000)	(20000)
PROFIT PER CUSTOMER	221000	119000
PROFIT PER UNIT	$(221000 \div 350) = 631.43$	$(119000 \div 500) = 238$
	10.81	

Illustration

6-Twelve is an Indian - Japanese international chain of convenience stores for food, snacks, hot and cold beverages is formulating its activity-based budget for January 2018. 6-Twelve has only three product types: Soft Drinks, Fresh Drinks, and Ready to Eat Food. The budgeted data relating to three products are as under:

Activity and Driver	Cost Driver Rates		Summary of the Budgeted Data		
	Actual Rate (₹)	Budgeted Rate (₹)	Soft Drink (₹)	Fresh Drink (₹)	Ready to Eat Food (₹)
Ordering (per purchase order)	5,000	4,500	16	20	16
Delivery (per delivery)	4,000	4,100	13	60	20
Shelf-Stocking (per hour)	1,000	1,050	15	170	93
Customer Support (per item sold)	10	9	4,500	34,600	10,500

6-Twelve has a continuous improvement system to budgeting monthly activity costs for each month of 2018. February's budgeted cost-driver rate is 0.996 times the budgeted January 2018 rate. March's budgeted cost-driver rate is 0.996 times the budgeted February 2018 rate and so on.

Required

- (i) What is the total budgeted cost for each activity in January 2018.
- (ii) What advantages might 6-Twelve gain by using an activity-based budgeting approach over, say, an approach that allocates the cost of these activities to products as a percentage of the cost of goods sold?
- (iii) What is the total budgeted cost for each activity in March 2018 if March 2018 has the same budgeted amount of cost-driver usage as January 2018.
- (iv) What are the benefits of 6-Twelve adopting a kaizen budgeting approach? What are the limitations?

OF THE
TIME

STATEMENT SHOWING RELATIVE
EACH PRODUCT AREA USES
OF DRIVER AT EACH ACTIVITY AREA IS

<u>ACTIVITY</u>	SOFT DRINKS	FRESH DRINKS	READY TO EAT Food	TOTAL
i) ORDERING	30.77% $\frac{72000 \times 100}{234000}$	38.46% $\frac{90000 \times 100}{234000}$	30.77% $\frac{72000 \times 100}{234000}$	234000
ii) DELIVERY	13.98% $\frac{53300 \times 100}{381300}$	64.52% $\frac{246000 \times 100}{381300}$	21.50% $\frac{82000 \times 100}{381300}$	381300
iii) SHELF STOCKING	5.40% $\frac{15750 \times 100}{291900}$	61.15% $\frac{178500 \times 100}{291900}$	33.45% $\frac{97650 \times 100}{291900}$	291900
iv) CUSTOMER SUPPORT	9.07% $\frac{40500 \times 100}{446400}$	69.76% $\frac{311400 \times 100}{446400}$	21.17% $\frac{94500 \times 100}{446400}$	446400

CHAPTER-6

DECISION-MAKING

Decision Making — PART A(1)

CVP Analysis / Shutdown Point :

1) Meaning of Marginal Cost

Any expense which is fluctuating according to decision or increases or decreases according to volume is known as marginal cost .

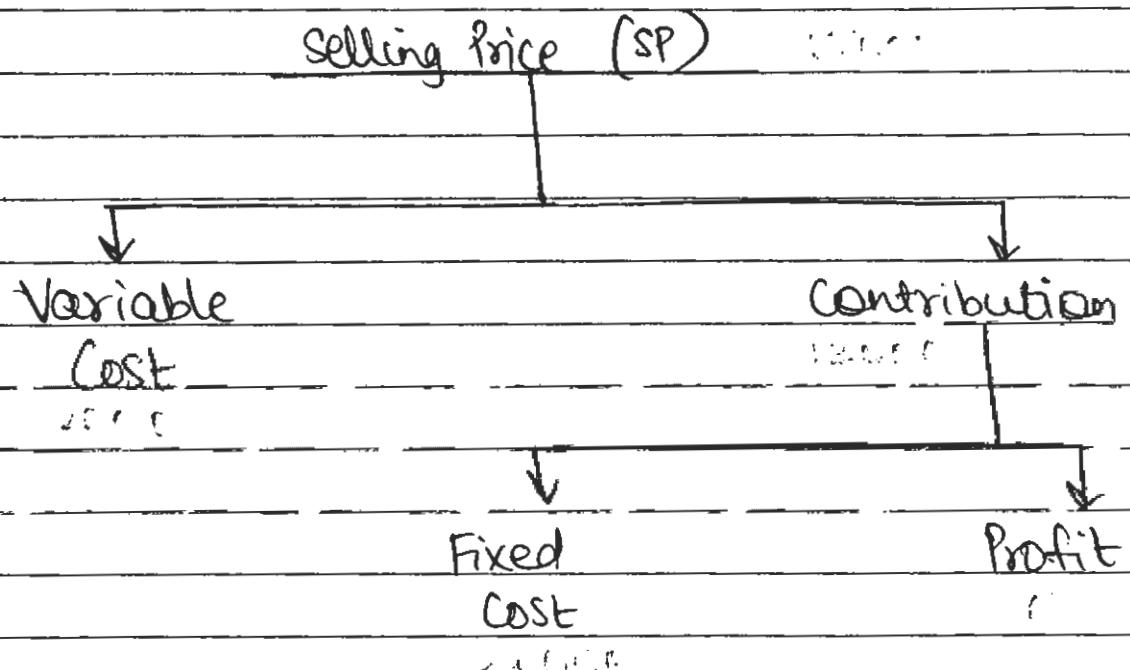
2) Meaning of Fixed Cost

Any expense which is constant upto 100% capacity is known as fixed cost .

3) Meaning of Semi-variable cost

It is a total of variable + fixed cost .

CHART I

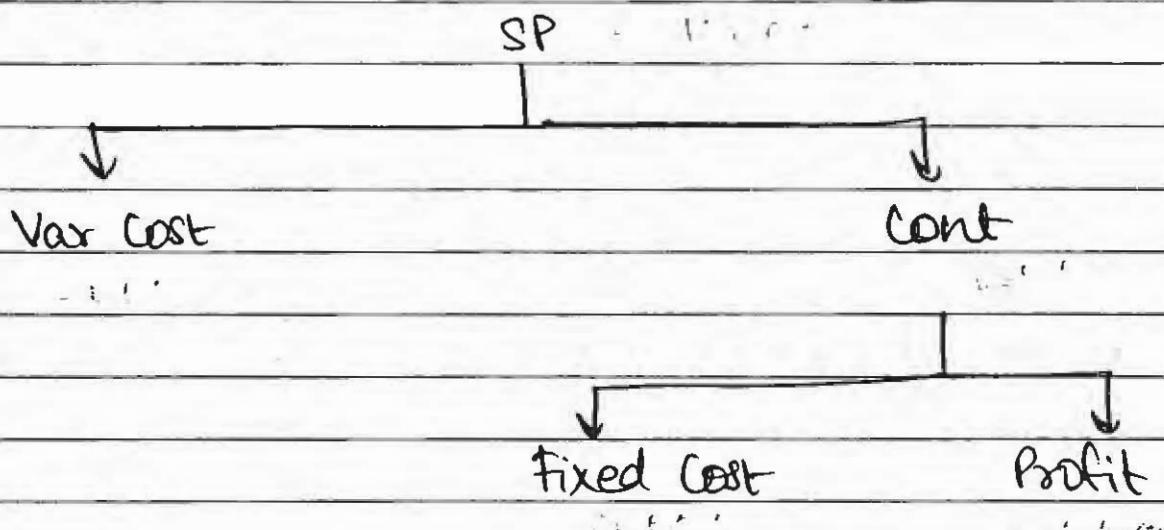


Statement showing Analysis of Profit/Loss

Sales	(2 x 15000)	30000
V.Cost	(2 x 2000)	(4000)
Contribution		26000
Fixed Cost		(26000)
Profit		0

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{Contribution}}$$

$$= \frac{26000}{13000} = 2 \text{ Students}$$



$$\begin{aligned}
 \text{Exp Sale for Reqd Profit} &= \frac{26000 + 26000}{13000} \\
 &= 4 \text{ students}
 \end{aligned}$$

Statement Showing Analysis of Profit/Loss

Sales	(4 x 15000)	60000
V-Cost	(4 x 2000)	(8000)
Contribution		52000
Fixed Cost		(26000)
Profit		<u>26000</u>

CHART — II

Expected Sales 4

$$\text{BEP Sales } 2 \times 15000 = 30000$$

MOS Sales 2

Var
Cost

$$2 \times 2000 \\ = 4000$$

Fixed
Cost

$$25000$$

Contribution

$$26000$$

Profit

$$0$$

Var.
Cost

$$2 \times 2000 \\ = 4000$$

Fixed
Cost

$$0$$

Contribution

$$26000$$

Profit

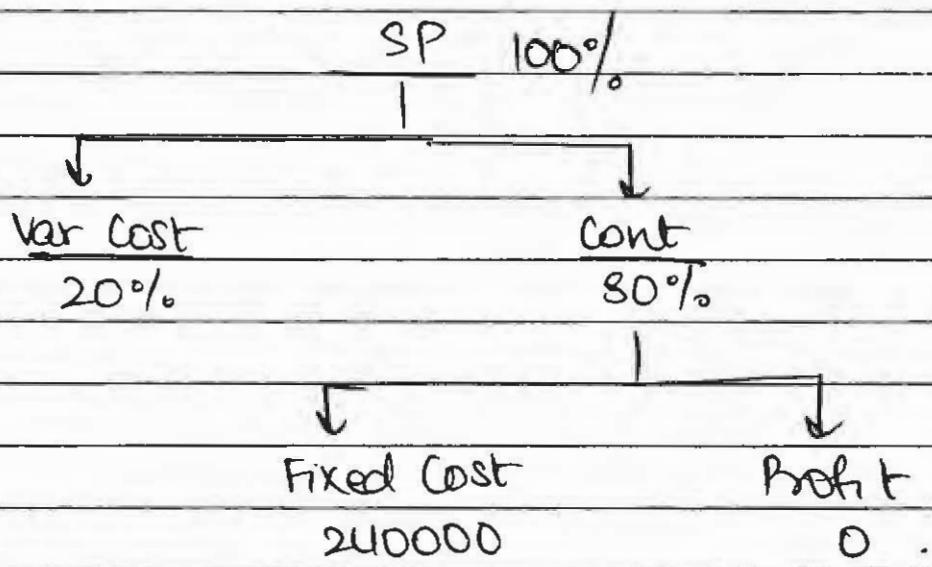
$$26000$$

Application of PV Ratio in Marginal Costing :

i) Meaning of PV ratio

It is a relationship between contribution to sales.

$$\text{PV ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$



$$\begin{aligned}\text{BEP} &= \frac{240000 \times 100}{80} \\ &= \text{Rs. } 300000\end{aligned}$$

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV ratio}} \times 100$$

SP 100%

Var Cost
20%

Cont
80%

Fixed Cost
240000

Profit
240000

$$\begin{aligned} \text{Expected Sales} &= \frac{240000 + 240000}{80} \times 100 \\ \text{for Reqd Profit} &= 600000 \end{aligned}$$

$$\begin{aligned} \text{Expected Sales} &= \frac{\text{Fixed Cost} + \text{Profit}}{\text{PV Ratio}} \times 100 \\ \text{for Reqd Profit} &= \end{aligned}$$

$$P.V \text{ ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

Subject to verification -

	Year I	Year II
Sales	100000	200000
V.Cost	(50000)	(100000)
Cont	50000	100000
Fixed Cost	(20000)	(20000)
Profit	<u>30000</u>	<u>80000</u>

$$P.V \text{ ratio} = \frac{50000}{100000} \times 100 = 50\%$$

Verification :

Year I

$$\begin{array}{ccccc} \text{Sales} & = & 100000 & & \\ \swarrow & & \searrow & & \\ V.Cost & & Cont & & \\ 50\% \times 100000 & & 50000 & & \\ = 50000 & & & & \end{array}$$

Year II

$$\begin{array}{ccccc} \text{Sales} & = & 200000 & & \\ \swarrow & & \searrow & & \\ V.Cost & & Cont & & \\ 50\% \times 200000 & & 100000 & & \\ = 100000 & & & & \\ \swarrow & & \searrow & & \\ F.Cost & & Profit & & \\ 20000 & & 80000 & & \end{array}$$

* First verify then use the formula.

whenever 2 periods are given in Q.

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	<u>Sales</u>	<u>Profit</u>
Period 1	14433	385
Period 2	18203	1139

$$\begin{aligned}
 \text{(i) PV ratio} &= \frac{\text{Ch in pt}}{\text{Ch in sales}} \times 100 \\
 &= \frac{754}{3770} \times 100 = 20\%
 \end{aligned}$$

Verification :

Period 1

<u>Sales</u>		
14433		
	<u>Var Cost</u>	<u>Cont</u>
	11546.40	2886.60
<u>Fixed Cost</u>	<u>Profit</u>	
2501.60	385	

Period 2

Sales			
	18203		
Var cost		Cont	
14562.40		3640.60	
fixed cost		Profit	
2501.60		1139	

(ii) Expected Sales = 12000

Var cost	Cont	
9600	2400	
Fixed cost	Profit / (Loss)	
2501.60	(101.60)	

(iii)

EXP Sales

$$= 22508$$

↓
Var Cost

↓
Cont

$$4501.60$$

↓
Fixed cost

$$2501.60$$

↓
Profit

$$2000$$

(iv)

BEP ~~Exp~~ sales

$$= 12508$$

↓
Var Cost

↓
Cont

$$2501.60$$

↓
Fixed cost

$$2501.60$$

↓
Profit

$$0$$

Concept of Combined, Common, Overall Basis Break Even Point (BEP)

[This concept is only applicable if fixed cost is one and the products are more than one].

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(a)

Sales

A	$60000 \times 33.33\%$	=	20000
B	$60000 \times 41.67\%$	=	25000
C	$60000 \times 16.67\%$	=	10000
D	$60000 \times 8.33\%$	=	5000
<u>60000</u>			

60000



Var Cost



Cont

A	$20000 \times 60\% = 12000$	
B	$25000 \times 68\% = 17000$	
C	$10000 \times 80\% = 8000$	
D	$5000 \times 40\% = 2000$	
<u>39000</u>		

21000

$$\therefore \text{Comb PV ratio} = \frac{21000}{60000} \times 100 = 35\%$$

$$\begin{aligned} \text{BEP} &= \frac{\text{Fixed Cost}}{\text{PV ratio}} \times 100 = \frac{14700}{35} \times 100 \\ &= \underline{42000} \end{aligned}$$

(b)

Sales

A	60000	x	25%	=	15000
B	60000	x	40%	=	24000
C	60000	x	30%	=	18000
D	60000	x	50%	=	3000
					<u>60000</u>

60000



Var Cost

Cont

19080

A	15000	x	60%	=	9000
B	24000	x	68%	=	16320
C	18000	x	80%	=	14400
D	3000	x	40%	=	1200

40920

$$\text{Comb PV ratio} = \frac{19080}{60000} \times 100 = 31.80\%$$

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV ratio}} \times 100$$

$$= \frac{14700}{31.80} \times 100 = 46226.42$$

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$$\begin{aligned}\text{Total Sales} &= 20000 + 25000 + 10000 + 5000 \\ &= 60,000\end{aligned}$$

Var Cost	Cont
Black $20000 \times 60\% = 12000$	<u>21000</u>
White $25000 \times 68\% = 17000$	
Scented $10000 \times 80\% = 8000$	
Naph $5000 \times 40\% = 2000$	
	<u>39000</u>

$$\text{Comb Pv ratio} = \frac{21000}{60000} \times 100 = 35\%$$

$$\text{BEP} = \frac{14700}{35} \times 100 = \underline{\underline{42000}}$$

Break Even Point (BEP) as per Required Ratio

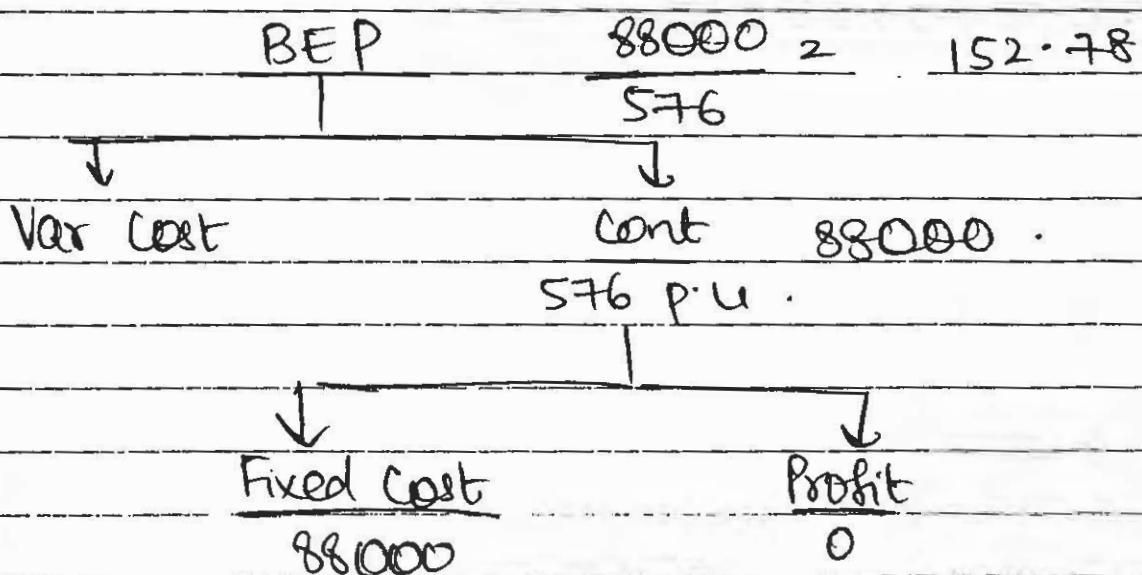
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Option 1. Average Cont p.u :

	<u>P</u>	<u>Q</u>
S.P	1800	2160
V.P	<u>(900)</u>	<u>(1800)</u>
Cont	900	360
Reqd Ratio	X 2	X 3
	$= 1800$	$= 1080$

$$\therefore \text{Avg Cont p.u} = \frac{1800 + 1080}{2+3}$$

$$= \text{Rs } 576 \text{ p.u.}$$

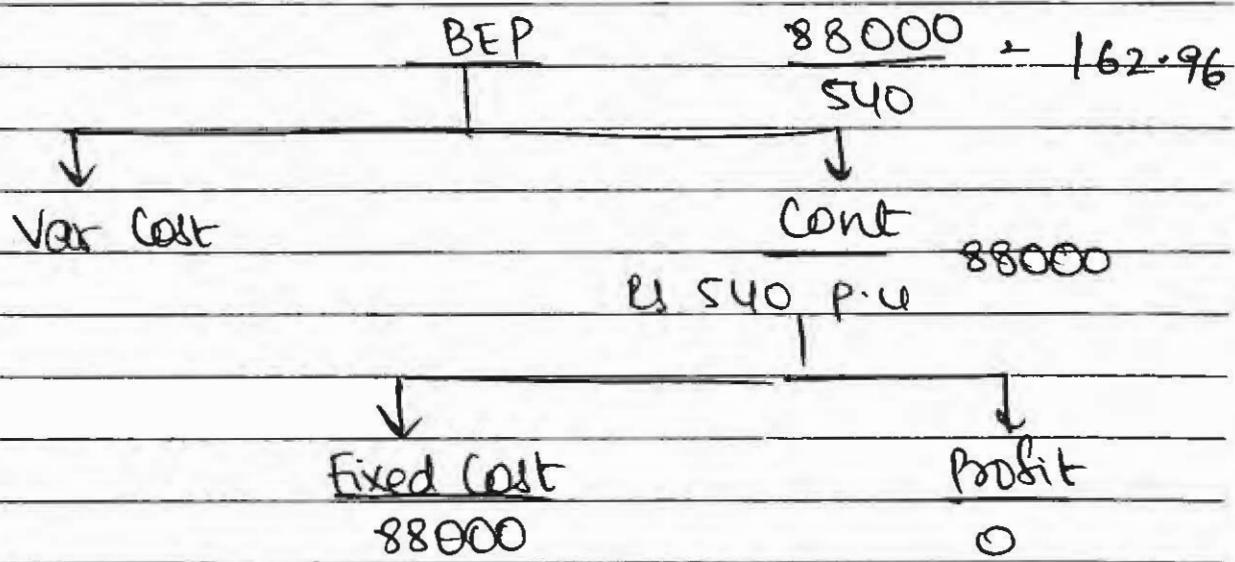


Option 2

	P	Q
SP.	1800	₹ 2160
V.P	(900)	(1800)
Cont	900	360
Prod Ratio	X 1	X 2
	= 900	= 720

$$\text{Avg cont pu} = \frac{900 + 720}{1+2}$$

$$= ₹ 540 \text{ p.u.}$$



∴ Option 1 is the optimal mix.

APPLICATION OF ABC IN MARGINAL COSTING

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APPLICATION OF OR IN MARGINAL COSTING

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SHUT DOWN POINT

1) Meaning of Shut Down Point

It is a point where the management can take the decision whether to continue the operation or not.

$$\text{Shut Down Point} = \frac{\text{Total Fixed Cost}}{\text{Contribution p.u}} - \frac{\text{Shutdown Cost}}{\text{PV ratio.}}$$

e.g.:

$$SP = 25000$$

Var Price
5000

Cont
20000

↓
F. Cost
800000

↓
Profit

If batch
continues

↓
Shut Down

$$\text{Rent} = 600000$$

$$\text{Rent} = 600000$$

$$\text{Rent} = 200000$$

$$\text{Shut Down Point} = \frac{(800000 - 600000)}{20000} = 10$$

Verification :

Students	9	10	11
Cont	180000	200000	220000
Fixed Cost	(80000)	(80000)	(80000)
	<u>(620000)</u>	<u>(600000)</u>	<u>(580000)</u>

↑ BEP as 600000

So if students fall below 10, rent as it
has to pay.

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Annual Prod'n = 200,000

Annual Fixed Cost = $200,000 \times 4 = 800,000$
Quarterly = $\frac{800,000}{4} = 200,000$

SP = 21

↓
Var Cost

↓
Cont

(8)

Dir mat	7.80
Dir lab	2.10
V OH's	2.50
S OH's	0.60
<hr/>	
	13

Shutdown Cost = $74,000 + 14,000$
= 88,000

Exp Sales = 10,000 units.
next quarter.

(i) Statement showing Analysis of Proposal

(1) If continued

Contribution

$$(10000 \text{ units} \times 8)$$

80,000

Fixed cost

(200000)

Profit / loss

(120000)

(2) If Shut Down

Contribution

$$(10000 \text{ units} \times 8)$$

80000

~~Fixed cost~~ loss

(88000)

Decision = Shut Down

(ii) Shutdown Point = $200000 - 88000$
8 p.u.
= 14000 units

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$$SP = \text{Rs. } 8$$

Var Cost
(75%) . Rs. 6

Cont
②

$$\begin{aligned} \text{Shut Down Costs} &= 130000 + 15000 \\ &= \text{Rs } 145,000 \end{aligned}$$

Statement Showing Analysis

(1) If Continued

Cont

(95000 x 2)	190000
Fixed Cost	(350000)
Pt loss	(160000)

(2) If Shut Down

loss (145000)

Decision = Shut Down.

$$\text{Shut Down Point} = \frac{350000 - 145000}{2 \text{ p.u}}$$

$$= \underline{\underline{102500 \text{ units}}}$$

$$\% = \frac{102500}{118750} \times 100 = \underline{\underline{86.31\%}}$$

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$$SP = 200$$

	↓	↓
<u>Var Cost</u>		<u>Cont</u>
Mat	65	(180) 86
Lab	30	
O/H's	33	
S. O/H's	16	
	<u>114</u>	

(1) Fixed cost if continue 1400000

$$(200000 \times 7)$$

Cont loss 4000000

$$(\cancel{86} 200000 \times 1 \times 40 \times 50\%)$$

$$\underline{\underline{5400000}}$$

(2) Fixed cost if shutdown

Shut Down cost 50000

Reopening 100000

Fixed cost 125000

275000

Shut Down Point = ~~4000000~~

$$5400000 - 275000$$

86

$$= \underline{\underline{59593.02}}$$

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Statement showing Analysis of Proposal

(1) If Continued

Saving in normal cost = 2300000

$$\left(\frac{2070000 \times 100}{90} \right)$$

$$\underline{(2070000)}$$

Savings	230000
'C' loss	(172500)
Net Saving	<u>57500</u>

(2) If Shutdown

(230000)

Decision: Continue Division 'C'

CHAPTER-6

Decision Making — Part B

Cost Concept in Decision Making

(Relevant Costing)

Meaning of Relevant Costing

Any expense which is fluctuating due to decision is known as relevant cost.

- eg: 1) fixed cost is not relevant for the decision if it is constant.
- 2) Variable cost is not relevant for the decision if it is constant under all the options.
- 3) Any expenses incurred in past before taking the decision is known as sunk cost and that's why it is fully irrelevant for the decision.
(eg: in case of material, book value or historical cost is totally irrelevant, the relevant is if the material is in regular use replace → if used → Or if no use then →
variable cost only)
- 4) If in the Q, the language is used like absorbed, allocated, applied then totally irrelevant for the decision.

Important Point

The above concept of relevant costing is only applicable if we are in ~~existing business~~ and not in new business.

LMR

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" Statement showing Analysis of Profit / Loss
(Relevant Costing)

Particulars	£	Reasons
(A) Revenues	2,000,000 (20000 x 100)	Future inflow
(B) Relevant Cost		
Material A	(400,000) (20000 x 2 x 10)	Replacement cost
Material B	(500,000) (20000 x 1 x 25)	Realisable value
Labour Grade 1	(0) (20000 x 2 x 4)	Under utilised
Labour Grade 2	(240,000) (20000 x 6 x 2)	Future Outflow

→ cont'd

Particulars	£	Reason
fixed OH's	0	Sunk Cost
Fixed OH's	(228,000)	Incremental Future Outflow
<u>Variable OH's</u>		
Grade		
1 $(20000 \times 2 \times 3)$	(120,000)	Future Outflow
2 $(20000 \times 6 \times 3)$	(360,000)	Future Outflow
Saving in fixed OH's	58,000	Opportunity Gain
Sales 'Y'	(1,90,000)	Opp Loss (1)
Profit :	<u>20,000</u>	
① <u>Sales 'Y' Opportunity Cost</u>		
Sales 'Y' (5000×70)	350,000	
<u>Less: Relevant Cost</u>		
Material (5000×12)	(60,000)	
Labour Grade 2 $(5000 \times 4 \times 2)$	(40,000)	
Subt Var OH's $(5000 \times 4 \times 3)$	(60,000)	
Even if not given	<u>190,000</u>	

Page 30 Case Study 3)

Statement showing Minimum Price (Relevant Cost)

Particulars (₹) Reasons

Relevant Cost

(1) cost to be incurred 29700 Future Outflow

(2) Material cost 2250 Opp Cost

(3) Wages

Dept A 1800 Future Outflow

(15 x 120)

Dept B 2500 Future Outflow

(25 x 100)

Dept B 8000 Opp Cost

(2500 x 3.20)

(4) Var OH's 1075 Future Outflow

(1800 + 2500) x 25%

(5) Delivery cost 1350 Future Outflow

(6) Super O/t 1050 Future Outflow

(7) Control Device (10350) ①

(8) Conv not carried 24600 ②

Rs. 61,975

① Opportunity Gain

Control Device = 10500

Relevant Cost

Dept A (1x120) = (120)

V-OH's (120 x 25%) = (30)

10350

② Opportunity Cost

Material Cost = 12000

Relevant Cost

Dept A (2x120) = (240)

V-OH's (240 x 25%) = (60)

Mat Scrap

11400

Drawings

1500

24600

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Statement showing Profit/Loss
(Relevant costing)

Particulars	(£)	Reason
<u>(A) Revenues</u>	900 000	Future inflow (50000×18)
<u>(B) Relevant Cost</u>		
<u>(a) Raw Mat</u>		
Posh	(125,000)	Replacement cost (50000×2.50)
Flash	(66,000)	Resale value (50000×1.10)
Splash	(112,000)	Replacement/purchase cost (40000×2.80)
	(137,500)	Purchase cost $(50000 \times 0.5 \times 5.50)$
<u>(b) Labour</u>		
Skilled	0	Fixed Cost $\text{Fixed } (50000 \times 1 = 12500) \quad 0$
Opp. Cost	(56250)	Opp. Cost $10 - 5.50 = 4.50 \quad (4.50 \times 12500)$
Unskilled	0	Not to terminate $(50000 \times 2 \text{ hrs} \times 0)$
<u>(c) Foreman Salary</u>	(9000)	Inc. Cost $(15000 - 6000)$

Particulars	(£)	Reason
(d) Depreciation		
MT 4	(15000)	Regular use
	(80000 - 65000)	
MT 7	(3000)	No use.
	(11000 - 8000)	
(e) V.OH's		
$\rightarrow 50000 \times 1.20$	(60,000)	Future Outflow
(f) F.OH's	—	Sunk Cost
Profit Loss	<u>316250</u>	

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	P	Q
Selling Price	200	216
<u>Relevant Cost</u>		
1) Petrol / oil	(10)	(20)
2) Wages	SAME	SAME
3) Lic/Ins/Dep	FIXED (share)	FIXED (share)
	<u>190</u>	<u>196</u> ✓

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Statement Showing Minimum Price:

Raw material R1 (Saving)	1250	Opp Gain
Labour cost G1		
Hrs reqd	250	
Avail	150 100	
(630 ÷ 42) X per hr	15	
	<u>1500</u>	(1500) Future outflow
G2	-	Capacity Available
Minimum Price =	<u>250</u>	

Decision Making - PART A (2)

Concept of Limiting Factor

→ Some constraint.

Steps for solving the sum :

Step 1 Statement showing contribution p.u per hour and rank for production .

Step 2 Statement showing production plan for maximum profit .

Step 3 Statement showing analysis of profit and loss .

Example :-

1) Products	SP	V.P	Cont	
A	100	60	40	÷ 2 hrs
B	100	40	60	÷ 4 hrs

maximum m hrs = 20,000 → Limiting Factor

Max Demand - → Limiting factor

A = 5000 units

B = 10000 units

Step 1 Statement showing cont p.u / phr and rank

	A	B
SP	100	100
VP	(60)	(40)
Cont p.u	40	60
÷ hrs	÷ 2	÷ 4
	= 20 hrs pu	= 15 pu
Rank	I	II

Step 2 statement showing prodn plan for max profit

Hours Avail	Product	Units	x hrs p.u	= Total Balance
20,000	A	5000	x 2	= 10,000 (20000 - 10000 = 10,000)
10,000	B	(2500)	x 4	= 10,000 (10000 - 10000 = 0)

Step 3 statement showing analysis of profit/loss

Products	Units	Cont(p.u)	Total
A	5000	x 40	= 200000
B	2500	x 60	= 150000
			350000
		Fixed Cost	(-)
		Profit Loss	<u>350000</u>

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Step 1 Statement showing cont p.u per hr and rank

	A	B	C
SP (p.u)	860	1040	930
VP (p.u)			
DM	(260)	(300)	(250)
DL	(130)	(270)	(260)
VOHs	(110)	(230)	(180)
Cont p.u.	360	240	240
÷ hrs	÷ 12	÷ 6	÷ 3
Cont p.u phr	= 30	= 40	= 80
Rank	III	II	I

Step 2 Statement showing prodn plan & max profit

Hours Avail	Product	Units × hrs p.u = Total	Balance
<u>case 1</u>			
3600	C	1200 × 3 = 3600	3600 - 3600 = 0.
<u>case 2</u>			
6000	C	1800 × 3 = 5400	6000 - 5400 = 600
600	B	100 × 6 = 600	0.

Hours Products Units x hrs = Total Balance

Avail

Case 3

8400	C	$1800 \times 3 = 5400$	3000
3000	B	$300 \times 6 = 1800$	1200
1200	A	$100 \times 12 = 1200$	0

Case 4

10800	C	$1800 \times 3 = 5400$	5400
5400	B	$300 \times 6 = 1800$	3600
3600	A	$300 \times 12 = 3600$	0

Step 3 Statement showing analysis profit / loss

level Prod Units x Cont p.u = Total Cont

3600	C	$1200 \times 240 = 288000$	
		- Fixed Cost	<u>(100000)</u>
		Profit	<u>188000</u>

6000	C	$1800 \times 240 = 432000$	
	B	$100 \times 240 = 24000$	
			<u>456000</u>
		- Fixed Cost	<u>(150000)</u>
		Profit	<u>306000</u>

8400	C	$1800 \times 240 = 432000$	
	B	$300 \times 240 = 72000$	
	A	$100 \times 360 = 36000$	

540000

(220000)

320000 max

- Fixed Cost

Level	Prod	Units x Cost p.u	=	Total Cost
10800	C	1800 x 240	=	432000
	B	300 x 240	=	72000
	A	300 x 360	=	108000
				612000
			- Fixed cost	(300000)
			Profit	312000

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Statement showing

P

Q

S.P

Hours Available

Products	Budg Units	hrs	*	
P	40000	x 2	=	80000
Q	80000	x 1	=	80000
				160000 hrs

$$\text{Rec Rate} = \frac{960000}{160000} = \text{Rs. } 6$$

Break up of cost

P = 20

Q = 40

Var
8

Fixed
 2×6
 $= \text{Rs. } 12$

Var
34

Fixed
 1×6
 $= \text{Rs. } 6$

Step 1 Statement showing cont p.u | phr and rank

	P	Q
SP (p.u)	25	50
- VP (p.u)	(8)	(34)
Cont (p.u)	17	16
÷ hrs	÷ 2	÷ 1
	= 8.5	16
Rank	II	I

Step 2 Statement showing prodn plan for max profit

Hrs Avail	Product	Units x hrs = Total	Balance
160,000	Q	100,000 x 1 = 100,000	60,000
60,000	P	- 30,000 x 2 = 60,000	0.

Step 3 Analysis of Profit/Loss

	Budgeted	Maximum
P	= 680,000 (40,000 x 17)	= 510,000 (30,000 80,000 x 17)
Q	= 1280,000 (80,000 x 16)	= 1600,000 (100,000 x 16)
Total Cont	1960,000	2110,000
Fixed Cost	<u>(960,000)</u>	<u>(960,000)</u>
Profit	<u>1000,000</u>	<u>1150,000</u>

(iii)

Statement showing SP (PU) of 'C'

Cut down 'P' (lowest cont p/hr)
and save the hours

$$(30000 \times 2) = 60000 \text{ hrs}$$

$$(\text{C}) (60000 \div 1.5) = 40000 \text{ units}$$

(2)

FCost $'C'$ (40000×2) = ₹ 80000

'Q' (100000×34) = 3400000

FCost = 960000

Addn = 60000

Profit = 1150000

Addn Profit

$$(200000 \times 15\% \times 1/12) = 2500$$

Sales ('C & Q') 6412500

Q
 100000×50
 $= 50,00,000$

C
1412500
 $\div 40000 \text{ unit}$
- 35.3125

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	<u>P</u>	<u>Q</u>
SP (P·u)	215	320
V·P (P <u>u</u>)		
Mat X	(22)	(28)
Mat Y	(8)	(32)

Wages

A	(36)	(54)
B	(18)	(36)
C	(54)	-
D	-	(72)
V·OH's	(23)	(14.30)
Cent P·u	<u>54</u>	<u>83.70</u>

Elaborated cost

$$\begin{aligned} \text{Fixed cost} &= 12000 \times 12 \\ &= \underline{\text{Rs } 144000} \end{aligned}$$

Hours Regd P·u

	<u>P</u>	<u>Q</u>
A	$36 \div 6 = 6$	$54 \div 6 = 9$
B	$18 \div 6 = 3$	$36 \div 6 = 6$
C	$54 \div 6 = 9$	—
D	—	$72 \div 6 = 12$

Max hrs Avail

$$A = 300 \times 30 \times 8 = 72000$$

$$B = 300 \times 16 \times 8 = 38400$$

$$C = 300 \times 18 \times 8 = 43200$$

$$D = 300 \times 24 \times 8 = 57600$$

Statement showing prodn plan for max profit

(case I \rightarrow P and Q)

Dept	Hrs	\div	Hrs	= Poss	Balance \div hrs = Poss	Units
Avail		p.u		Units	p.u	Units
A	72000	\div	6	= 12000	$(72000 - 4800 \times 6) \div 9 = 4800$	
B	38400	\div	3	= 12800	$(38400 - 4800 \times 3) \div 6 = 4000$	
C	43200	\div	9	= [4800]	$(43200 - 4800 \times 9) = 0$	
D	57600	\div	12		$(57600 - 4800 \times 12) \div 12 = 4800$	

(case II \rightarrow Q and P)

Dept	Hrs	\div	Hrs	= Poss	Balance \div hrs = Poss	Units
Avail		p.u		Units	p.u	Units
A	72000	\div	9	= 8000	$(72000 - 4800 \times 9) \div 6 = 4800$	
B	38400	\div	6	= 6400	$(38400 - 4800 \times 6) \div 3 = 3200$	
C	43200	\div	-	= -	$(43200 - 0) \div 9 = 4800$	
D	57600	\div	12	= [4800]	$(57600 - 4800 \times 12) \div 0 = 4800 -$	

It is solved this way because there is no limiting factor specified. Hence, we compare both options.

Whether to produce P or Q first to give us the optimum profit.

(a) Statement showing Analysis of Profit | Loss

	P and Q	Q and P
P	259200	172800
	(4800 × 54)	(3200 × 54)
Q	334800 (4800 × 83.70)	401760 (4800 × 83.70)
Total Cont	594000	574560
- Fixed Cost	(144000)	(144000)
Profit (Loss)	<u>450000</u>	<u>430560</u>

(b) Statement showing analysis of P&L

<u>Product</u>	<u>Units × Cont = Total.</u>
P	$4800 \times 54 < 259200 - 144000^{1152}$
✓ Q	$4800 \times 83.70 = 401760 - 144000^{2532}$

Prodn plan for max profit
It material = 180,000

$$P = \left(\frac{180000}{22+8} \right) = 6000 \text{ units subj to } 4800 \text{ unit}$$

$$Q = \left(\frac{180000}{28+32} \right) = 3000 \text{ units.}$$

Products: $\text{Unit} \times \text{cont} - \text{Total FC} = \text{Profit}$

$$P: 4800 \times 54 - 259200 - 144000 < 11520$$

$$Q: 3000 \times 83.70 = 251100 - 144000 = 10710$$

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i) Hours Regd p.u

A	10	÷	10	=	1
B	20	÷	10	=	2
C	10	÷	10	=	1
D	60	÷	10	>	6

ii) Fixed cost is not relevant

Step 1 Statement showing loss on per p.u phr & Rank

	A	B	C	D
purchase price	(60)	(59)	(52)	(168)
mfg V cost	57	55	57	144
	(62-5)	(59-4)	(68-11)	(164-20)
(loss)/Profit	(3)	(4)	5	(24)
	÷ 1	÷ 2	÷ 6	
p/hr loss	= (3)	= (2)	Purchase = (4)	
Rank	II	III		I

Ans
(i)

Step 2 Statement showing prodn plan for max profit

Hrs

Avail	Products	Units \times ^{Wt} p.u = Total	Balance
20000	D	$2800 \times 6 = 16800$	3200
3200	A	$2000 \times 1 = 2000$	1200
1200	B	$600 \times 2 = 1200$	0

Ans (ii)

Step 3 Statement showing Analysis

$$\text{For 'B'} = 3500 - 600 = \text{Balance } 2900$$

Purchase 'B'
 $(2900 \times 59) = 171100$

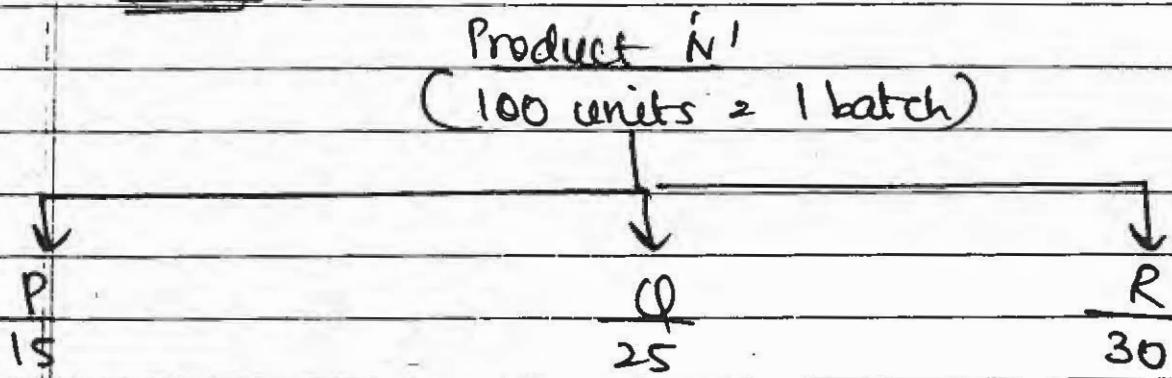
	mfg cost 2 nd shift
D·Mat	27
D·Lab	10
(25% + 8)	
D·Exp	20
	57×2900
	$= 165300$

F·OH^s
 $(2900 \times 2\text{hrs}) = 5800$ 3000
~~168300~~

1000 or part
thereof.

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Given :



$$\text{Present prodn} = \frac{42000}{15+25+30} = 600 \text{ batches}$$

Cont per batch

S.P (per batch)

$$37.50 \times 100 = 3750$$

$$- V.P = (2075)$$

$$\text{Cont} \quad \quad \quad 1675$$

$$\text{Fixed Cost } (1100 \times 600 \text{ batches}) = 660,000$$

Demand

①

$$600 \times 150\% = 900 \text{ batches}$$

②

$$600 \times 175\% = 1050 \text{ batches}$$

Statement showing loss on pur per batch
per hr & rank

~~For~~ For 1 batch

	P	Q	R
pur price	8000 (555)	(700)	(840)
	(5.55×100)	(7×100)	(8.40×100)
mfg var cost	375	450	450
loss on pur	(180)	(250)	(390)
	÷ 15	÷ 25	÷ 30
loss p/hr	= (12)	= (10)	= (13)
	II	III	I

Ans(i) Statement show analysis of P&L

Product	Prodn	×	Cont	
N	600		1675	= 1005000
		-	fixed cost	(660000)
			Profit	<u>345000</u>

Statement showing production plan for max pro

hrs Avail	Product	NO of batch x hrs = Total p.b	Balance
--------------	---------	-------------------------------	---------

42000	R	$900 \times 30 = 27000$	15000
Demand $= 900$			

15000	P	$900 \times 15 = 13500$	1500
-------	---	-------------------------	------

1500	Q	$(60) \times 25 = 1500$	0
------	---	-------------------------	---

Purchase Q $(900 - 60) = 840$ batches

~~Remaining~~
~~12000~~

~~± 10500~~

42000

Demand $= 1050$	R	$1050 \times 30 = 31500$	10500
--------------------	---	--------------------------	-------

10500	P	$(700) \times 15 = 10500$	0
-------	---	---------------------------	---

Purchase P $= (1050 - 700) = 350$ batches

Q $= 1050$ batches

Statement showing analysis of P&L

	Demand = 900 batches	Demand = 1050 batches
Cost	= 1507500 (900×1675)	= 1758750 (1050×1675)
less F cost	<u>(660000)</u>	<u>(660000)</u>
Profit / Loss	<u>847500</u>	<u>1098750</u>
Addn pur cost	<u>(210000)</u>	<u>(262500)</u>
'O'	<u>(840 \times 250)</u>	<u>(1050 \times 250)</u>
'P'	<u>-</u>	<u>(63000)</u>
	<u>-</u>	<u>(350 \times 180)</u>
Profit / Loss	<u>637500</u>	<u>773250</u>

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Statement showing analysis of proposal

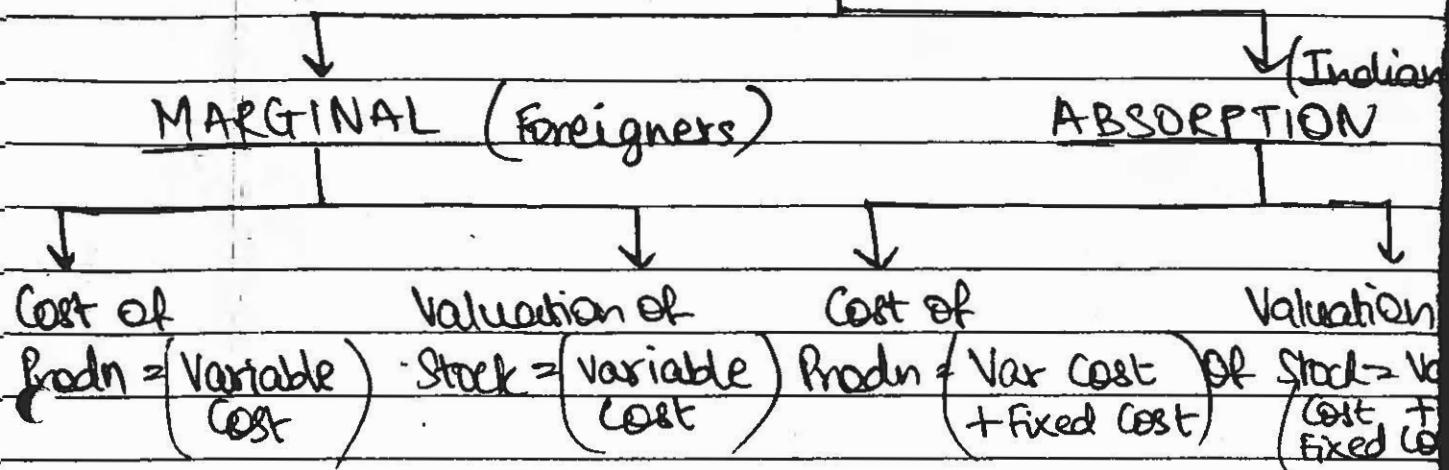
	<u>Present</u>	<u>Proposed</u>
A) Sales	500,000	572,000 $(500,000 \times 110\% \times 104\%)$
B) Relevant Cost		
D Mat	(250,000)	(269,500)
D Lab	(100,000)	(107,800)
V OH's	(40,000)	(43,120)
Cont	11,000	15,1580
F. Cost	((60,000))	((58,800))
Profit	50,000 $(400,000 \times 12.5\%)$	92780

$$\text{Return} = \frac{92780}{400,000} \times 100 \\ = \underline{\underline{23.195\%}}$$

CHAPTER-1

Chpt 1 - Intro to Strategic Cost Management

Marginal v/s Absorption Costing



Case Study 1 - Page 1

Note no. (1)

Fixed Production OH^s (Quarterly)

Budget

Actual

Units	LR	Exp	Units	Exp
200	200	40,000	220	40,000
(800 ÷ 4)	(160000 ÷ 4)			(160000 ÷ 4)

Fixed OH^s A/c

To Bank A/c

40,000

By Recov

44,000

(220 × Rs 200)

To over recov

4000

(a) Absorbed OTTs = 44000 ($220 \times \text{Rs } 200$)

(b) Overrecovery = $44000 - 40000$
= Rs. 4000

(c) Statement showing analysis of P&L as per absorption costing

(A) Sales $\left(\frac{800000 \times 160 \text{ units}}{400} \right)$ = 320000

(B) Cost of Sales

(i) Variable cost of Prod'n. 176000
 $\left(\frac{320000 \times 220 \text{ units}}{400} \right)$

(ii) Fixed cost of Prod'n. 44000

Op finished goods $-$

Cl finished goods $\underline{(60000)}$

$\left(\frac{220000 \times 60}{220} \right) \rightarrow (220 - 160)$

$\rightarrow (176000 + 40000)$

Selling OTTs

Variable $\left(\frac{160000 \times 160}{400} \right)$ 64000

Fixed $\left(\frac{240000}{4} \right)$ 60000

284000 (284000)

Operating Profit 36000

Over Recovery 4000

Net Profit 40,000

(d)

Statement showing analysis P&L as per
marginal costing

(2)

(A) Sales $(\frac{800000}{400} \times 160)$ 320000

(B) Cost of Prod.
variable cost

$(\frac{320000}{400} \times 220)$ = 176000

Op finished goods = -
cl finished goods = (48000)

$(\frac{176000}{220} \times 60)$ ~~220000~~
128000

Selling & Dist

Variable cost

$(\frac{160000}{400} \times 160)$ = 64000

Contribution contribution ~~192000~~ 192000

128000

Fixed cost $(160000 \div 4)$ (4000)

Fixed cost $(240000 \div 4)$ (60000)

Net Profit 28000

* Why is there a diff in profit
in absorption & marginal?

Profit as per absorption	40000
- Over valuation of closing stock	(12000)
Profit as per marginal cost.	<u>28000</u>

→ Due to diff in valuation
of stock

Page 1 Case Study 2

1)	Sales	150000
	+ Closing Stock	20000
-	Opening Stock	10000
	Production	160000

2) Fixed Prod'n OH^s

Budget		Actual	
Units	RP	RP	Units
180000	(2)	360000	160000
(90%)			360000

F.O.H.C A/c

To bank	360000	By Recovery (160000 x 2)	320000
		By under recovery	40000

3) Variable cost for Prod'n = 1795000
 $(160000 \times 11) + 35000$

4) Variable cost for selling = 450,000
 (150000×3)

5) Fixed cost for selling = 270000

$$b) \text{ Sales} = 30,00,000 \\ (150000 \times 20)$$

(1)(a) Statement showing Analysis of Profit & Loss

$$(A) \text{ Sales} = 30,00,000$$

(B) Cost of Sales

$$\text{Var Cost of Prod} \quad 1795000 \quad (\underline{1795000})$$

$$\text{Fixed Prod OH's} \quad 320000 \quad (\underline{320000})$$

Op finished goods

$$(11+2) \times 10000 \quad 130000$$

11 \rightarrow Var + Fixed
2 \rightarrow Op finished goods

$$(2115000 \times 20000) \quad (264375)$$

$$(160000)$$

$$\text{COGS} \quad 1980625$$

Selling OH's

$$\text{Variable} \quad 450000$$

$$\text{Fixed} \quad 270000$$

$$\text{cost of sales}$$

$$(\underline{0}) \quad (2700625)$$

$$\text{Under Recovery}$$

$$(40000)$$

$$\text{Net Profit}$$

$$\underline{259375}$$

b) Statement showing Analysis of P&L

(A) Sales 300000

(B) Cost of Sales 2130625
 Variable Costs of Prod
 $= 1795000$

Op finished goods
 $\times 11 \times 10000 = 110000$

U finished goods
 $(1795000 - 160000) \times 20000 = 224375$

COGS 1680625

Selling OHS
 variable = 450000

Cost of sales 2130625

Fixed Cost $(360000 + 270000)$ 630000
 $\underline{239375}$

Showing Recd

As per absorption	259375
+ Op stock	20000
- overvalued valn of cl stock	<u>(40000)</u>
As per marginal	<u>239375</u>

CHAPTER - 4

COST MANAGEMENT TECHNIQUES

COST MANAGEMENT Technique

Target Costing :- COST CONTROL & COST REDUCTION

i) Meaning of Target Price:

It is a price which is based on customers expectation but at the time of calculation for this price, we should satisfy two specific conditions :

- 1) Quality of product should be the same.
- 2) Saving should be a permanent nature.

Page 13 Case Study 12

Target Sales $(12000 \times 32) = 384000$

↓
V Cost
190500

↓
Cont
193500

$$\begin{array}{l} \downarrow \\ \text{M&S} \\ 12000 \times 8 \\ = 96000 \end{array}$$

$$\begin{array}{l} \downarrow \\ 94500 \\ \text{Fixed} \\ 140000 + 28500 \\ = 168500 \end{array}$$

$$\begin{array}{l} \downarrow \\ \text{Profit} \\ 25000 \end{array}$$

Total labour Regd = x

Labour rate per hour = 4

V.OH's per hour = 0.5
4.50

$$4.50 \times x = 94500$$

$$x = 21000 \text{ hours}$$

$$\div 12000 \text{ units}$$

$$= 1.75 \text{ hrs/p.u.}$$

Page 13 Case Study 11

Page 13 Case Study 11

	Splash	Flash
S.P (p.u)	3	4
Reduction	(0.60)	(0.50)
	2.40	3.50
Exp Sales - Target	720000	350000
Target Units	300000	100000
BEP	60%	60%
MOS	40%	40%
Target Profit	69120	17500
Present fixed cost	108000	27000

Statement showing (i) BEP sales (ii) MOS sales
 (iii) Total sales

	Splash	Flash
BEP	= 180000	= 60000
	$(300000 \times 60\%)$	$(100000 \times 60\%)$
MOS	= 120000	= 40000
	$(300000 \times 40\%)$	$(100000 \times 40\%)$
Total	<u>300000</u>	<u>100000</u>

Target sales

Splash

$$\text{Target sales} = 720000$$

$$\begin{array}{l} \downarrow \text{BEP} \\ \text{Need sales} \end{array}$$

(60%)

432000

$$\begin{array}{l} \downarrow \\ \text{Cont M08} \end{array}$$

(40%)

288000

V. Cost

$$218880 \times 60\%$$

$$= 131328$$

$$\begin{array}{l} \text{Cont} \\ 103680 \end{array}$$

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Flash

Target sales = 350000

BEP (60%)

210000

MOS (40%)

140000

V Cost

153750

Cont

26250

V Cost

122500

Cont

17500

(122500) (60%)

10.

F Cost

26250

Profit

0

F Cost

0

Profit

17500

Redn = 27000

(26250)

750

★ Application of ABC

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Statement showing Cost Sheet as per ABC

	P1	P2	Revised P1	Revised P2
<u>DIRECT COST</u>				
Dir Mat	= 407.50	= 292.10	= 381.20	= 263.10
<u>INDIRECT COSTS.</u>				
(1) Activity				
mat handling	= 102	= 55.20	= 85.20	= 46.80
	(1.20×85)	$\frac{1.20 \times 46}{(1.20 \times 85)}$	(0.70×71)	$\frac{0.70 \times 39}{(1.20 \times 85)}$
(2) Assembly mng	= 128	= 76	= 84	= 64
	(1.40×3.2)	(1.40×1.9)	(40×2.1)	(40×1.6)
(3) Mach insertion	= 33.60	= 21.70	= 41.30	= 20.30
	(0.70×48)	$\frac{0.70 \times 31}{(0.70 \times 48)}$	(0.70×59)	$\frac{0.70 \times 29}{(0.70 \times 59)}$
(4) manual insert	= 75.60	= 31.50	= 25.20	= 21
	(2.10×36)	(2.10×15)	(2.10×12)	(2.10×10)
(5) Qty testing	= 35	= 27.5	= 30	= 22.5
	(25×1.4)	(25×1.1)	(25×1.2)	(25×0.9)
Factory Cost	<u>781.70</u>	<u>504</u>	<u>646.90</u>	<u>437.70</u>
TARGET COST			680	390
RESULT			YES	NO

Page No. _____
Date _____

Statement showing Revised Cost sheet

	<u>Rev P1</u>	<u>Rev P2</u>
Factory Cost	646.90	437.70
Saving in Assembly Cost	(25.20) [(40-28)×2.1]	(19.20) [(40-28)×1.6]
	621.70	418.50
Target Cost Result	680 YES	390 NO

CHAPTER-3

CASE STUDY ON LEAN SYSTEM INNOVATION (J.I.T)

* Application of Just in Time in
Target Costing
(lean system & innovation)

Page 9 Case Study 8

Given :

	4-Trad ⁿ	4-JIT	2-JIT
Purchase Price (pu)	140	140.02	136
Annual Demand	13000	13000	13000
ROI	15% p.a.	15%	15%
Ordering Cost	£ 2 per order	2	2
Storage Cost	£ 3.10 pu/p.a	3.10	3
Order Size	1000	100	100
Stock out	—	50X £ 4	360X £ 8
Addn cost	—	—	13000X 0.05
Return from Cost	—	—	13000X 25X 2

Statement Showing Analysis of Proposal

Y-Trad \approx Y-JIT Z-JIT.

Purchase Cost	= 1820000	= 1820260	= 1768000
	(13000 × 140)	(13000 × 140.02)	(13000 × 136)

ROI	= 10500	= 1050.15	= 1020
	(1/2 × 1000 × 140 × 15%)	(1/2 × 100 × 140.02 × 15%)	(1/2 × 100 × 136 × 15%)

Ordering Cost	= 26	= 260	= 260
	(13000 / 1000 × 2)	(13000 / 100 × 2)	(13000 / 100 × 2)

Storage Cost	= 1550	= 155	= 150
	(1/2 × 1000 × 3.10)	(1/2 × 100 × 3.10)	(1/2 × 100 × 3.05)

Stock out cost	—	= 200	= 2880
		(50 × 4)	(360 × 8)

Add'l Cost	—	—	= 650
			(13000 × 0.05)

Customer	—	—	= 6500
			(13000 × 2% × 25)

TOTAL COST	1832076	1821925.15	17779460
			1821925.15

J.I.T. AS PFA NEW SYLLABUS MODULE

(I.C.A.F.)

Page No.	6
Date	

CASE STUDY No.....

Illustration

KP Ltd. (KPL) manufactures and sells one product called "KEIA". Managing Director is not happy with its current purchasing and production system. There has been considerable discussion at the corporate level as to use of 'Just In Time' system for "KEIA". As per the opinion of managing director of KPL Ltd. -

"Just-in-time system is a pull system, which responds to demand, in contrast to a push system, in which stocks act as buffers between the different elements of the system such as purchasing, production and sales. By using Just In Time system, it is possible to reduce carrying cost as well as other overheads".

KPL is dependent on contractual labour which has efficiency of 95%, for its production. The labour has to be paid for minimum of 4,000 hours per month to which they produce 3,800 standard hours.

For availing services of labour above 4,000 hours in a month, KPL has to pay overtime rate which is 45% premium to the normal hourly rate of ₹10 per hour. For avoiding this overtime payment, KPL in its current production and purchase plan utilizes full available normal working hours so that the higher inventory levels in the month of lower demand would be able to meet sales of month with higher demand level. KPL has determined that the cost of holding inventory is ₹70 per month for each standard hour of output that is held in inventory.

KPL has forecast the demand for its products for the first six months of year 2018 as follows:

Month	Demand (Units)
Jan	1,200
Feb	1,500
Mar	1,800
Apr	2,000
May	1,800
Jun	1,500

Following other information is given:

- (i) All other production costs are either fixed or are not driven by labour hours worked.
- (ii) Production and sales occur evenly during each month and at present there is no stock at the end of Dec'17.
- (iii) The labour are to be paid for their minimum contracted hours in each month irrespective of any purchase and production system.

Required

As a chief accountant you are requested to COMMENT on managing director's view.

STATEMENT SHOWING 'INVENTORY' HOLDING COST
UNDER CURRENT SYSTEM

PARTICULARS	(HRS)	(HRS)	(HRS)	(HRS)	(HRS)	(HRS)
	JAN	FEB	MARCH	APRIL	MAY	JUNE
OPENING INVENTORY	-	650	690	430	880	1030
PRODUCTION	3800	3800	3800	3800	3800	3800
DEMAND	(3150)	(3760)	(4060)	(3350)	(3150)	(4830)
CLOSING INVENTORY	650	690	430	880	1030	-
Avg-Inventory = $\frac{\text{OPENING} + \text{CLOSING}}{2}$	325	= 670	= 560	655	955	515
	$\frac{0+650}{2}$	$\frac{650+690}{2}$	$\frac{690+430}{2}$	$\frac{430+880}{2}$	$\frac{880+1030}{2}$	$\frac{1030+0}{2}$

STATEMENT SHOWING INVENTORY HOLDING COST FOR SIX MONTHS

MONTH	AVG INVENTORY	$\times 70 =$	TOTAL (Rs)
JAN	325	$\times 70$	22750
FEB	670	$\times 70$	46900
MARCH	560	$\times 70$	39200
APRIL	655	$\times 70$	45850
MAY	955	$\times 70$	66850
JUNE	515	$\times 70$	36050
			259600

STATEMENT SHOWING RELEVANT OVERTIME COST AS PER J.I.T. SYSTEM.

PARTICULARS	JAN	FEB	MARCH	APRIL	MAY	JUNE
DEMAND (HRS)	3150	3760	4060	3350	3650	4830
PRODUCTION (J.I.T.)	3150	3760	4060	3350	3650	4830
NORMAL STANDARDS HRS (AVAILABLE)	3800	3800	3800	3800	3800	3800
SHORTAGE	-	-	-260 (4060 - 3800)	-	-	1030 (4830 - 3800)

STATEMENT SHOWING OVERTIME COST

OVERTIME HRS.

MARCH 260

GROSS-HR.

$$\frac{(260 \times 100)}{95} = 273.68 \times 159.50 \\ (110 + *49.50) \\ * (45/110)$$

JUNE 1030

$$\frac{(1030 \times 100)}{95} = 1084.21 \times 159.50$$

$$(273.68 \times 159.50) + (1084.21 \times 159.50) = 216583$$

STATEMENT SHOWING COMPARATIVE COST

COST	AS PER TRADITIONAL	AS PER J.I.T.
COST	257600	216583
SAVING AS PER J.I.T. 1		$(257600 - 216583) \\ = 41017$

CHAPTER :- 2 CASE STUDY ON MODERN BUSINESS (T.Q.M)

Application of TQM in Target Costing
(Modern Business Environment)

Concept 1: Inspection v/s No Inspection

Case Study 4 , Page 4

Step 1 : Statement showing good units

	X Company	Y Company	
With Inspection	without Inspection	With Inspection	without Inspection
Gross Purchases	10000	10,000	10,000
Loss @ time of Purchase	(270)	(450)	
	$(10,000 \times \frac{3}{100} \times \frac{90}{100})$		$(10,000 \times \frac{5}{100} \times \frac{90}{100})$
Qty for Payment	9730	10,000	9550
Loss @ time of Production	(30)	(300)	(50)
	$(10,000 \times \frac{3}{100} \times \frac{10}{100})$	$(10,000 \times \frac{3}{100})$	$(10,000 \times \frac{5}{100} \times \frac{10}{100})$
Good units	9700	9700	9500

Step 2: Statement showing Total cost / Good Units

	X Company With <u>Inspection</u>	Y Company Without <u>Inspection</u>	Z Company With <u>Inspection</u>	W Company Without <u>Inspection</u>
Purchase Cost	17,514	18,000	16,617	17,400
	$(9730 \times \frac{180}{100})$	$(10,000 \times \frac{180}{100})$	$(9,550 \times \frac{174}{100})$	$(10,000 \times \frac{174}{100})$
Inspection Cost	2,400	-	2400	-
	$(10,000 \times \frac{24}{100})$		$(10,000 \times \frac{24}{100})$	
Loss of Prod'n. Cost	54	540	90	900
	$(30 \times \frac{180}{100})$	$(300 \times \frac{180}{100})$	$(50 \times \frac{180}{100})$	$(500 \times \frac{180}{100})$
Total Cost	19,968	18,540	19,107	18,300
÷ Good Units	÷ 9700	÷ 9700	÷ 9500	÷ 9500
Cost per unit	2.06	1.91	2.01	1.93
		✓		

Concept 2 : High Quality v/s Low Quality Material

Department D = 1,00,000 units - ?

$$\text{Labour hrs Required} = \frac{(2,50,000)}{1,00,000} = 2.5 \text{ hrs p.u.} @ \text{₹ 0.5 per hour}$$

Factory Overhead = 1,50,000

Fixed = 50,000

$$\text{Variable} = \frac{1,00,000}{2,50,000}$$

$$= \text{₹ } 0.4 \text{ per hour}$$

Input

5

Output

1

Good Qty @ 1.05 p.u.

Low Quality @ 80 p.u.

Output loss Good units

100 10

Output loss Good units

100 20 80

$$= \frac{1,00,000 \times 100}{90}$$

$$= 111,112$$

$$= 1,11,112$$

Good
1,00,000

Scrap

$$11,112 \times 0.30$$

$$\text{Sold for} = 3334$$

1,00,000

$$\left(\frac{1,00,000 \times 100}{80} \right)$$

$$= 125000$$

1,00,000

Good
1,00,000

Scrap
25,000

Can be
Sold
for ₹ 5000

Extra hrs = 50,000

Addl. Machne = 3000

Statement showing Analysis of proposal

	<u>Good Quality</u>	<u>Low Quality</u>
Gross Production	1,11,112	1,25,000
Scrap Sales	(11,112)	(25,000)
Good Units	1,00,000	1,00,000
Material costs	= 5,83,332	500,000
	(1,11,112 \times 5x1.05)	(125,000 \times 0.80)
Labour costs	1,38,890	156,250
	(1,11,112 \times 2.5 \times 0.5)	(1,25,000 \times 2.5 \times 0.5)
Additional Lab cost	25,000	
	(50,000 \times 0.5)	
F. OHd (Variable)	1,11,112	1,25,000
	(1,11,112 \times 2.5 \times 0.4)	(1,25,000 \times 2.5 \times 0.4)
F. OHd (Variable)		20,000
		(50,000 \times 0.4)
Machine Cost Fixed 20,000	-	3,000
Scrap sale	(3334)	(5000)
	9,30,006	8,24,250

Case Study 6Before TQM

(i)

<u>Units to customer</u>	<u>Return by customer</u>	<u>Good units</u>
5000 units	250	5250
	(5% of 5000)	

After TQM

<u>Units to customer</u>	<u>Return by customer</u>	<u>Good units</u>
5000 units	2.5% of 5000	5125
	= 125	

<u>Gross Prod</u>	<u>Down Grade</u>	<u>Good units</u>
100	12.5	87.5
$(\frac{5250 \times 100}{87.5}) = 6000$ units		5250

<u>Gross Prod</u>	<u>Down Grade</u>	<u>Good units</u>
100	7.5	92.5
$(\frac{5125 \times 100}{92.5})$		5125

$$(6000 - 5250) = 750 \text{ Downgrade units are discounted by } 30\%$$

5540.54

i.e. 5541

$$(5541 - 5125) = 416 \text{ (Down grade)}$$

Ans No. (i) (ii)

Statement showing purchases

<u>Input to Machine</u>	<u>Loss due to Process</u>	<u>Input to Product</u>	<u>Input to Machine</u>	<u>Loss due to Process</u>	<u>Input to Product</u>
100	4	96	100	2.5	97.5

$\cancel{5250 \times 96}$	$\cancel{48000 \times 4}$	$6000 \times 8 = 48,000$	$\cancel{44328 \times 2.5}$	$\cancel{44000 \times 2.5}$	$5541 \times 8 = 44,328$
				$= 44000$	45464.61

<u>Gross Purchase</u>	<u>Less due to Poor Receipt</u>	<u>Input</u>	<u>Gross Purchase</u>	<u>Less due to Poor Receipt</u>	<u>Input</u>
100	5	95	100	2.3	97
$50,000 \times 100$		50,000	46800	45464.61	44328
75			$46800 \times 7.8 \times 100$	45464.61×7.8	44328×7.8
			45464.61	45464.61	44328
			$= 46871$	$= 46871$	$= 44328$
$= 52,631.57$					

Statement showing Gross Machine Hours

Before TQM

After TQM

Gross Hours	Idle Time	Net Hours	Gross Hours	Idle time	Net hours
100	20	80	100	12.5	87.5

$$\begin{aligned} & (3600 \times 100) \\ & \frac{80}{80} \\ & = 3600 \text{ hrs} \end{aligned}$$

$$\begin{aligned} & 6000 \times 0.6 \\ & = 3600 \text{ hrs} \end{aligned}$$

$$\begin{aligned} & (2770.5 \times 100) \\ & \frac{87.5}{87.5} \\ & = 2770.5 \text{ hrs} \\ & \boxed{3167} \end{aligned}$$

Ans(b) Statement showing analysis of Profit / Loss

(a) Sales

Before QMP

50,00,000

After QMP

50,00,000

(5000×100)
units

(5000×100)
units

(b) Relevant cost

(i) Material cost

(ii) Downgrade sale

525,000

2,91,200

$(750 \times 1000 \times 70\%)$ $(416 \times 1000 \times 70\%)$

(B) RELEVANT COST

(i) Material cost

$= (21,05,280) = (18,74,840)$

$(52632 \times 40) (46871 \times 40)$

(2) Inspection cost

$= (52,632) = (46,871)$

$(52,632 \times 1) (46871 \times 1)$

(3) Other check cost

$= (2,50,000) = (1,50,000)$

	before DMHR	After DMHR
(4) Product variability cost	$= (\underline{1,50,000})$ $(\cancel{50,00,000 \times 3\%})$	$= (\underline{6,50,000})$ $(50,00,000 \times 1\%)$
(5) Machine cost	$= (\underline{18,00,000})$ $(4500 \text{ hrs} \times 400)$	$= (\underline{12,15,800})$ $(3167 \text{ hrs} \times 400)$
(6) Admin S/P	$= (\underline{6,00,000})$	$= (\underline{5,40,000})$
(7) Pre Prod	$= (\underline{2,00,000})$ $3,67,088$	$= (\underline{6,00,000})$ $\overline{3,62,689}$

The total quality costs are then the sum of all these costs.

$$\begin{aligned}
 & \text{Cost of Quality (COQ)} \\
 & = \\
 & \text{Cost of Control} \\
 & (\text{Prevention Cost} + \text{Appraisal Cost}) \\
 & + \\
 & \text{Cost of Failure of Control} \\
 & (\text{Internal Failure Cost} + \text{External Failure Cost})
 \end{aligned}$$

- In its simplest form, COQ can be calculated *in terms of effort* (hours/days).
- A better approach will be to calculate COQ *in terms of money* (converting the effort into money and adding any other tangible costs like test environment setup).
- The best approach will be to calculate COQ *as a percentage of total cost*. This allows for comparison of COQ across projects or companies.
- To ensure impartiality, an external person say the accountant must determine the Cost of Quality of a project/ product rather than a person who is a core member of the project/ product team (Say, someone from the Accounts Department).

Illustration

CASE STUDY-3

A company produces and sells a single product. The cost data per unit for the year 2017 is predicted as below:

Direct Material	35
Direct Labour	25
Variable Overheads	15
Selling Price	90

The company has forecast that demand for the product during the year 2017 will be 28,000 units. However, to satisfy this level of demand, production quantity will be increased?

There are no opening stock and closing stock of the product.

The stock level of material remains unchanged throughout the period.

The following additional information regarding costs and revenue are given:

- 12.5% of the items delivered to customers will be rejected due to specification failure and will require free replacement. The cost of delivering the replacement item is ₹5 per unit.
- 20% of the items produced will be discovered faulty at the inspection stage before they are delivered to customers.
- 10% of the direct material will be scrapped due to damage while in storage.

Due to above, total quality costs for the year is expected to be ₹10,75,556.

The company is now considering the following proposal:

1. To introduce training programmes for the workers which, the management of the company believes, will reduce the level of faulty production to 10%. This training programme will cost ₹4,50,000 per annum.
2. To avail the services of quality control consultant at an annual charges of ₹50,000 which would reduce the percentage of faulty items delivered to customers to 9.5%.

Required

- (i) PREPARE a statement of expected quality costs the company would incur if it accepts the proposal. Costs are to be calculated using the four recognised quality costs heads.
- (ii) Would you RECOMMEND the proposal? Give financial and non-financial reasons.

NO(ND) i)

STATEMENT SHOWING ANALYSIS OF T.Q.M

PRESENT			PROPOSED		
BEFORE - T.Q.M			AFTER T.Q.M.		
EXTERNAL FAILURE			→ EXT-FAILURE.		
UNITS	RETURN	GOOD	UNITS	RETURN	GOOD
DEL	BY		DEL	BY	
TO	CUSTOMER	(UNI)	TO	CUSTOMER	CUSTOMER
CUSTOMER			CUSTOMER	CUSTOMER	GOODS
28000	28000	28000	100	9.5	90.50
	(28000 × 100)				
100	12.5	87.5	100	9.5	90.50
		28000			28000
<u>(28000 × 100)</u>			<u>(28000 × 100)</u>		
87.50			90.5		
= 32000			= 30939		

VERIFICATION

UNITS DEL	32000	30939
Loss 12.5%	(4000)	2939
Good Units	28000	28000

EXT-FAI-COST

DMat	35.00	35.00
DLab	25.00	25.00
V.O.	15.00	15.00
DEL-COST	5.00	5.00
	<u>80.00</u>	<u>80.00</u>
<u>(4000 UNIB × 80) = 320000</u>		<u>X 2939 = 235120</u>

No6 No(2)

STATEMENT SHOWING INTERNAL FAILURE COST

GROSS PRODUCTION	LOSS DUE TO DEFECTS	GOOD UNITS	GROSS PRODUCTION	LOSS DUE TO DEFECTS	GOOD UNITS
100	20	80	100	10	90
($\frac{32000 \times 100}{80}$)	32000		($\frac{30939 \times 100}{90}$)	30939	
<u>= 40000 UNITS</u>			<u>= 34377</u>		

~~Cost~~

Dmat	35	35
Dlab	25	25
V.O.	15	15
	75	75
	X 8000	X 3438
= <u>600000</u>	= <u>251850</u>	

STATEMENT SHOWING			MATERIAL SCRAPPED		
100	10	90	100	10	90
(40000×100)	40000		34377		34377
$\underline{90}$			(34377×100)	90	34377
$= 44444.44$					
$(44444.44 - 40000) = 4444.44$			$= 34377$	34377	
$(4444.44 \times 35) = 155555$			$(34377 - 34377) = 0$	34377	34377
$(155555 + 100000) = 255555$			$(34377 \times 35) = 120065$	120065	133665

STATEMENT SHOWING ANALYSIS OF ~~TOOK~~ EXP. DLTY COST.

	CURRENT SITUATION	PROPOSED SIT
PREV-COST	-	450000
APP-COST	-	50000
EXT-F-COST	320000	235120
INF-F-COST	755556	391538
	<u>395556</u>	<u>1126538</u>

Chapter 7 & Chapter 9

PRICING DECISION AND DIVISIONAL TRANSFER PRICING

Meaning of Transfer Price :

It is an internal price between one division to others on the basis of mutual understanding but this method is only applicable if divisions are individual, independent, separate profit centres, separate cost centres etc.

* Methods of Transfer Price :-

- 1) Total Cost + Opportunity Cost .
- 2) Total Cost + ROI .
- 3) Total Cost + ROI with tax adjustment .
- 4) Relevant Cost Concept Basis .
- 5) Market value .
- 6) Total cost + share Profit .
- 7) Variable cost + contribution .
- 8) Any other method as per mutual understanding .

● Method 1 : Total Cost + Opportunity Cost .

* Application of Limiting Factor in Transfer Price —

Steps for solving the sum :

- i) Statement showing contribution per unit and rank for prodn .
- ii) Statement showing production plan for maximum profit .
- iii) Final decision .

Page 47 Case Study 53 A :

i) Statement showing cont p.u/ph & rank for prodn.

	P	Q	R	S
S.P. (p.u)	350	345	280	230
- Var cost	(330)	(310)	(180)	(185)
Cont p.u	20	35	100	45
÷ hr	÷ 3	÷ 4	÷ 2	÷ 3
Cont p.u/ph	= 6.67	= 8.75	= 50	= 15
Rank	IV	III	I	II

ii) Statement showing production plan for maximum profit

Avail Product	Units x hrs p.u	Total	Balance Hrs.
4000 R	2800 x 2	= 5600	(24000 - 5600)
8400 S	1800 x 3	= 5400	(18400 - 5400)
3000 Q	(3250) x 4	= 13000	—

iii) Statement showing Transfer Price (p.u)

Hrs reqd for 'S' (2000 units x 3) = 6000 hrs

Cut 'P' (min cont) and save hrs (1500 x 4) = 6000 hrs

Opp cost of (R) 35 x 1500 = 52500

manfg v. cost 'S' (Rs 185 x 2000) = 370000

422500

÷ 2000 units

Transfer Price (p.u) = Rs 211.25

Q3(ii) i) Statement showing production plan for maximum profit

hrs Avail	Product	Units x hrs p.u = Total	Balance Hrs.
2000	R	$2800 \times 2 = 5600$	$(32000 - 5600)$
26400	S	$1800 \times 3 = 5400$	$(26400 - 5400)$
10000	Q	$3500 \times 4 = 14000$	$(21000 - 14000)$
000	P	$2333.33 \times 3 = 7000$	—

ii) Statement showing Transfer Price (p.u).

Hrs Reqd for 'S' $(2000 \times 3) = 6000$ hrs.
Cut 'P' (min cont) and save hrs $(2000 \times 3) = 6000$ hrs

Opp cost 'P'	$(Rs. 20 \times 2000)$	=	40,000
Mfg cost 'S'	$(Rs 18.5 \times 2000)$	=	370000
			<u>410000</u>
			$\div 2000$ units

Transfer Price (p.u) = Rs. 205.

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Q(a) i) Statement showing cont p.u | p.h and rank for prodn.

	X	Y	Z
Selling price (p.u)	96	92	80
Var Cost (p.u)	(33)	(24)	(28)
Cont (p.u)	63	68	52
÷ hrs	÷ 6	÷ 8	÷ 4
cont p/hr	= 10.5	= 8.5	= 13
Rank	II	III	I

ii) Statement showing prodn plan for max profit.

rs Avail	Product	Units x hrs p.u = Total	Balance Hrs.
3000	Z	300 x 4 = 1200	(1300 - 1200)
11800	X	800 x 6 = 4800	(11800 - 4800)
7000	Y	500 x 8 = 4000 4000	(7000 - 4000)
3000			

iii) Statement showing Transfer Price (p.u)

hrs Regd for 'Y' (300×8) = 2400 hrs
 Cut down 'Y' (non-cont) and
 save the hrs (300×8) = 2400 hrs

Opp cost 'Y' (300×68) = 20400

iii) Transfer Price (p.u)

It will be Rs. 24 only as hours are avail.

Goal Congruence = (Rs 24 - 45)

no no

b) (i) Statement showing prodn plan for max profit:

hrs Avail	Product	Units × hrs p.u = Total	Balance Hrs
800	Z	300 × 4 = 1200	(8000 - 1200)
1800	X	800 × 6 = 4800	(6800 - 4800)
1000	Y	250 × 8 = 2000	-

ii) Statement showing Transfer Price (p.u).

Hrs Reqd for 'Y' (300 × 8)	=	2400 hrs.
Cut down 'Y' (250 × 8)	=	2000 hrs
Cut down 'X' (66.67 × 6)	=	400 hrs

Opp Cost 'Y' (250 × 68)	=	17000
Opp Cost 'X' (66.67 × 63)	=	4221
Mfg v. Cost 'Y' (300 × 24)	=	7200
		28421
	÷ 300 units	
	=	Rs 94.74

Ques

c) i) Statement showing prodn plan for max profit

Rs Avail	Product	Unit X hrs per	= Total	Balance Hrs
000	Z	300 X 4	= 1200	(12000 - 1200)
0800	X	800 X 6	= 4800	(10800 - 4800)
5000	Y	500 X 8	= 4000	(6000 - 4000)
2000				

ii) Transfer price (P.u)

~~Opp cost + mfg var cost~~

Hrs Reqd for 'Y' (300 X 8)	=	2400 hrs
Available	=	2000 hrs
Balance, cut down 'Y' (50 X 8)	=	400 hrs

$$\text{Opp cost 'Y'} (50 \times 68) = 3400$$

$$\text{mfg var cost 'Y'} (300 \times 24) = 7200$$

10600

÷ 300 units

$$\text{Transfer price (P.u)} = \text{Rs } 35.33.$$

Goal Congruence = Between Rs 35.33 to Rs 45.

Page 46 Case Study 51 (Cost + ROI)

Statement showing Transfer Price (p.u) Cost + ROI

Variable Cost (400000 units x 10)	40,00,000
Fixed Cost	8,00,000
	<u>48,00,000</u>

ROI

$$(500000 + 300000 + 200000) \times 28\% = \frac{280000}{5080000} \div 400000 \text{ units}$$

$$\text{Transfer Price (p.u)} = \underline{\underline{12.70 \text{ (p.u)}}}$$

Page 47 Case Study 53

Statement showing Transfer Price (p.u)

Costs:

Material	50,000
Other Var Cost	60,000
Fixed Cost	40,000
	<u>150,000.</u>

$$(a) \text{ROI} = 150000 \times 20\% \times \frac{100}{60} (\text{after tax}) \\ = \underline{\underline{50,000}}$$

$$\therefore \text{Transfer Price (p.u)} = 150000 + \underline{\underline{50,000}} \\ = 200,000 \div 20000 \text{ units} \\ = \underline{\underline{10 \text{ (p.u)}}}$$

(b)

$$S.P = 100 \text{ (List Price)}$$

$$\frac{7.50 \times 100}{50} = 15.$$

Discount (40%)
40.

Cost
50 (100 - 50).

Profit

$$\frac{10 \times 6\% \times 100}{60} = 10$$

$$\frac{150000}{20000} = 7.50$$

50Verification

S.P	15
Disc 40%	(6)
	9
Cost	(7.50)
Profit Before Tax	1.50
Tax 40%	(0.60)
Profit After Tax	<u>0.90</u>

$$ROI = \frac{(0.90 \times 100)}{15} = 6\%$$

↳ Profit Regd.

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Statement showing Selling Price (P.U.)

Material	480000
labour	160000
Variable OH's	320000
Fixed OH's	500000
	<u>1460000</u>

Let sales turnover = x .

Let selling price = x .

\therefore Sales turnover = $80000 \times x = 80000x$. x .

\therefore Profit before tax = $(12\% \times \frac{100}{60}) = 20\%$ on
cap employed.

\therefore Fixed capital = $12 \text{ lacs} \times 20\%$
 $= 240000$

Varying = $80000x \times 50\% \times 20\%$
 $= 0.10x$.

~~240000 + 80000x~~

$240000 + 1460000 + 0.10x = x$

$x = 1888888.88$

$\div 80000 \text{ units}$

$= \text{Rs } 23.611$

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$$\therefore MRP = \text{Rs. } x$$

$$\text{Sales} \rightarrow 40,000 \times x = 40,000x$$

$$\text{Discount } 20\% \quad (8000x)$$

$$32000x$$

$$\text{Discount} = (0.20x)$$

$$S.P (P.U) = 0.80x$$

$$\text{Sales} = 0.80x \times 40,000 \text{ units} = 32000x$$

$$\text{Sales} = 40,000x$$

$$\text{Discount } 20\% = (8000x)$$

$$32000x$$

Fixed O/P's

$$\begin{aligned} \text{Var Cost} &= (60 \times 40000) \\ &= 2400000 \\ &\quad 550000 \\ &= 2950000 \end{aligned}$$

Cap Employed

$$\begin{aligned} \text{Fixed Assets} &= 800000 \\ \text{Current Assets} &= (32000x \times 50\%) \\ &= (800000 + 16000x) \\ &\quad \times 25\% \\ \text{Profit} &= 200000 \\ &= 200000 + 4000x \end{aligned}$$

$$\cancel{400000} - \cancel{400000} = 2950000 + 204000x$$

$$40000x = 2950000 + 204000x$$

$$32000x = 2950000 + 200000 + 4000x$$

$$26000x = 3150000$$

$$x = \text{Rs } 112.50 \text{ p.u}$$

Page 48 Case Study 54Statement showing Analysis of Profit/Loss

IF TP	=	Market Value	(I) Total Cost + Profit
		800000 1200000	800000 1200000
(A) Bottle Div			
TP	1400000	2000000	1261277 1654964
mfg cost	(1040000)	(1440000)	(1040000) (1440000)
(I) Profit/Loss	360000	560000	
(B) Mfg Div			
Sales	9120000	12780000	9120000 12780000
mfg cost	(6480000)	(9680000)	(6480000) (9680000)
T.P	(1400000)	(2000000)	(1261277) (1654964)
(I) Profit/Loss	1240000	1100000	1378723 1445036
(I) + (II)	1600000	1660000	1600000 1660000

(I) If TP = Total Cost + Profit

	800000	1200000
Sales	9120000	12780000
Cost - Bottle	(1040000)	(1440000)
mfg	(6480000)	(9680000)
Profit	1600000	1660000

↓	↓	↓	↓
10400000	: 6480000	1440000	: 9680000
Profit : 221277	1378723	214964	1445036
P 1040000	620	1440000	
TP 261277		TP 1654964	

Comments :

The above analysis clearly shows that if the transfer price is based on market value then the profit of bottle div will increase & main mfg will decrease and if the transfer price is based on total cost + shared profit then the profit of main mfg will increase and bottle div will decrease.

Page 56 Case Study 66 — H.W

classmate

Date _____

Page _____

classmate

Date _____

Page _____

Page 50 Case Study 57

A - Company

Harvesting	Oil-Mill		Marketing	
Output	Input	Output	Input	Output
2000 kg	2000 kg	1000 kg	1000 kg	500 cans @
V.Cost = 5000 (2000×2.50)	V.Cost = 10000 (1000×10)		V.Cost = 1875 (500×3.75)	
F.Cost = 10000 (2000×5)	F.Cost = 7500 (1000×7.50)	Sales = 62500 (1000×62.50)	F.Cost = 4375 (500×8.75)	Sales = 75000 (500×150)
Gross = 25000 (2000×12.50)				

(i)

Statement showing Analysis of profit / loss

Sales	$(500 \text{ cans} \times 150)$	75000
V.Cost	$(5000 + 10000 + 1875)$	<u>16875</u>
	Contribution	58125
Fixed Cost	$(10000 + 7500 + 4375)$	<u>21875</u>
	Profit	<u>36250</u>

(ii) (1) Statement Showing Transfer Price (VCost + Cont)

Sales	75000		
V-Cost	(16875)		
Cont	58125		
		↓	↓
Costs	5000	: 10000	: 1875
Cont	17222	34444	6459

	V-Cost	Cont	TP
Harvesting	5000	17222	22222
Oil Mill	10000+22222	34444	66666
Marketing	1875+66666	6459	75000

(2) Statement Showing Transfer Price (Market Price)

	Harvesting	Oil-Mill	Marketing
Market Value	25000	62500	75000

iii) Harvesting = Market Value.

Oil Mill = Variable Cost + Contribution.

Page 50 Case Study 56Given :A CompanyDivision X

Output — Component

Mfg Cost

$$5000 \text{ units} = 562500$$

+

$$\text{excess } 5000 \text{ units} = 337500$$

$$TP = \text{Rs. } 90 \text{ (pu)}$$

Division YInput
ComponentOutput
'P'Mfg Cost

$$5000 \text{ units} = 1406250$$

+

$$\text{excess } 5000 \text{ units} = 281250 \\ (5000 \times 56.25)$$

(iii)

(i) Statement showing Analysis of Profit/Loss (Div X)

Units	TP	Mfg Cost	Profit/(Loss)
5000	$5000 \times 90 = 450000$	(562500)	= (112500)
10000	$10000 \times 90 = 900000$	($562500 + 337500$)	= 0
15000	$15000 \times 90 = 1350000$	($900000 + 337500$)	= 112500
20000	$20000 \times 90 = 1800000$	($1237500 + 337500$)	= 225000
25000	$25000 \times 90 = 2250000$	($1575000 + 337500$)	= 337500
30000	$30000 \times 90 = 2700000$	($1912500 + 337500$)	= (450000)
			+112500

Statement showing Analysis of Profit/Loss (Div Y)

Units	Sales	Mfg Cost	T.P.	Profit/(Loss)
5000	$5000 \times 393.75 = 1968750$	(1406250)	(450000)	= 112500
10000	$10000 \times 298.5 = 2985000$	($1406250 + 281250$)	(900000)	= 397500
15000	$15000 \times 247.5 = 3712500$	($1687500 + 281250$)	(1350000)	= 393750
20000	$20000 \times 208.5 = 4170000$	($1968750 + 281250$)	(1800000)	= 120000
25000	$25000 \times 180 = 4500000$	($2250000 + 281250$)	(2250000)	= (281250)
30000	$30000 \times 150.75 = 4522500$	($2531250 + 281250$)	(2700000)	= (90000)

(ii) (a) Statement showing Analysis of Profit/Loss

	Division X	Division Y
4(b)	Pt max	Pt max
Division X - Profit	450000	0
Division Y - Profit	(990000)	397500
Total Profit/(Loss)	<u>(540000)</u>	<u>397500</u>

Page 48 Case Study 53B.

~~Handwritten~~

Given:

AB cycle

Division - A

Frame - Output

$$\begin{aligned} T.P / S.P &= 2000 \text{ p.u} \\ V.P &= 1200 \text{ p.u} \end{aligned} \quad \boxed{800 \text{ p.u}}$$

Division - B

Final Product

$$\begin{aligned} S.P &= 3000 \text{ p.u} \\ V.P &= 1500 \text{ p.u} \end{aligned} \quad \boxed{500 \text{ p.u}}$$

Capacity = 1000

<u>Outsider</u>	<u>Balance</u>
800	200

(i) Yes, Div A should transfer to Div B because there is an incremental profit of Rs. 160,000 ($800 \text{ p.u} \times 200 \text{ units} = \text{Rs. } 160000$).

(ii) Transfer Price = Variable cost + Contribution.

$$S.P = 3000$$

$$V.P A = (\cancel{1200})$$

$$V.P B = (\underline{1500})$$

$$300$$

$$\begin{array}{c} \text{V.Cost} \quad \cancel{1200} \quad : \quad 1500 \\ \text{133} \quad \quad \quad \quad 167 \end{array}$$

$$\therefore \text{Div A to Div B} = 1200 + 133 = 1333 \text{ (TP)}$$

(iii)

No.

Profit if sale to outside $(2000 - 1200) \times 200 = 160,000$ If Div - B $(1333 - 1200) \times 200 = 26,600$

Page 49 Case Study 55

Given:

Division A

Annual Prod'n = 200,000 units

V-Cost	(200000×1)	200000
F-Cost		500000
		700000

ROI:

$$\begin{aligned} & (200000 + 500000 + 500000) \times 20\% \\ & \quad \frac{240000}{940000} \\ & \quad \div 200000 \\ & \quad S.P = R.I. 4.70 \end{aligned}$$

Division A



Option - I

Produce = 200,000 units

Sales = 150,000 @ 4.70

T.P = 50000 @ 2

This is
indifferent at theROI we will get only
when we sell full 200,000
units @ 4.70. But in
option - I and in option - II
both we are selling less
than 200,000 units @ 4.70.So by comparing investments
we will not get anything.

Option - II

Produce = 150,000 units

Sales = 150,000 @ 4.70

Reduce Investments = 200,000

Reduce Fixed O.H.S = 250,000

Statement showing Analysis of proposal :

	<u>200000 units</u>	<u>150000 units</u>
Sales	705000 (150000×4.70)	705000 (150000×4.70)
T.P	100000 (50000×2)	-
V-Cost	(200000) (200000×1)	(150000) (150000×1)
F. Cost	(500000)	(475000)
Profit / (Loss)	<u>$(105000) - 105000$</u>	<u>80000</u>

Page 53 Case Study 60Statement showing Analysis of Proposal

Selling Price	Variable Price	Contribution	Units	Total Cont.
25	17	8	10000	80000
24.50	17	7.50	16500	78750
24	17	7	11000	77000
23.50	17	8.50	9500	80750
23	17	9	9000	81000
22.50	17	9.50	8500	80750
22	17	10	8000	80000

Page 53 Case Study 61Statement showing Transfer Price

Target Profit

250,00,000

Int on w/cap

(120000000 x 11.5%)

13800000

Regd Profit

= 38800000

Fixed Cost

= 40000000

Cont

= 78800000

Target Cont = 78800000

External

SP	2500
V.P	(1600)

900

X 60000 units

= 54000000

Cont - Regd

24800000

÷ 40000 units

P.U = 620

$$TP = 620 + 1600 = 2220$$

(ii)

Outsider

70000

Balance

30000

V.Cost

for addn 10,000 = 2500

Page 51 Case Study 58

Tycoon Ltd.

Textile Unit

capacity = 500000 mts.

↓
Outsider

Process House
50%
= 250000

Process House
30%
= 150000

Idle
20%
= 100000

Process House

Input	Output	SP
100 mts	1 bundle	
150000	1500	825
250000	2500	725

$$V \cdot \text{Cost} = (3 + 1 \cdot 20) = 4 \cdot 20 \\ F \cdot \text{Cost} = 412000$$

$$V \cdot \text{Cost} = 80 \text{ per bundle} \\ F \cdot \text{Cost} = 100000$$

(i) Statement Showing Analysis of Profit/Loss

	Ans (a) 80%	Ans (b) 100%	Ans (c) 80%	Ans (c) 100%
--	----------------	-----------------	----------------	-----------------

Textile Unit

$$\text{TP} = 900000 \quad 1500000 \quad 900000 \quad 1400000$$

(150000×6) (250000×6) (150000×6) (250000×5.60)

$$\text{Sales} = 1500000 \quad 1500000 \quad 1400000 \quad 1400000$$

(250000×6) (250000×6) (250000×5.60) (250000×5.60)

$$\text{VP} = (1680000) \quad (2100000) \quad (1680000) \quad (2100000)$$

(400000×4.20) (500000×4.20) (400000×4.20) (500000×4.20)

$$\text{F-Cost} = (412000) \quad (412000) \quad (412000) \quad (412000)$$

$$\text{(A) Pt (loss)} = 308000 \quad 488000 \quad 442000 \quad 288000$$

Process House

$$\text{Sales} = 1237500 \quad 1812500 \quad 1237500 \quad 1812500$$

(1500×825) (2500×725) (1500×825) (2500×725)

$$\text{V-Cost} = (120000) \quad (200000) \quad (120000) \quad (200000)$$

(1500×80) (2500×80) (1500×80) (2500×80)

$$\text{F-Cost} = (100000) \quad (100000) \quad (100000) \quad (100000)$$

$$\text{T.P} = (900000) \quad (1500000) \quad (900000) \quad (1400000)$$

$$\text{b) Profit (loss)} = 117500 \quad 12500 \quad 117500 \quad 112500$$

$$\text{c) F (B)} = 425500 \quad 500500 \quad 325500 \quad 400500$$

(ii) Statement showing Analysis of Profit/Loss

Capacity	T.P	P Loss
80%	6	425500 117500
100%	6	500500 12500
80%	6	325500 117500
100%	5.60	112500

Comments:

The above analysis clearly shows that if capacity utilisation is 80% , transfer price is 6 , then process house will get max profit .

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(i)

Statement showing Analysis of Profit / loss.

Div A to B

T.P (10 + 20%)	12
- V.P	(10)
(A) Profit	<u>2</u>

Div B

S.P	16
- V.P	(5)
- T.P	(12)
(B) Loss	<u>(1)</u>

$$\begin{aligned} \text{Company profit} &= (A) + (B) \\ &= 2 + (1) = \underline{\text{Rs 1}} \end{aligned}$$

(ii)

The above analysis clearly shows that there is a profit of Re 1 to the company inspite of B making a loss. So company should go for mfg.

Page 55 - CS - 63

Statement showing Budgeted S.P. p.u. (Budgeted = 200000) units

V.Cost (200000 units x Rs 32)	6400000
F.Cost	1600000
Total Cost =	8000000
+ Profit (25%)	2000000
Sales Value =	<u>1,00,00,000</u>

$$\therefore \text{true SP (pu)} = \frac{10000000}{200000} = \text{Rs. } 50 \text{ p.u.}$$

Statement showing Analysis of Proposal.

Qty sold	168000	152000	140000	128000	108000
X S.P (pu)	x 44	x 48	x 50	x 56	x 60
(A) Sales	= 7392000	= 7296000	= 7000000	= 7168000	= 6480000

(B) Relevant Cost

V.Cost	= (5376000)	= (4864000)	= (4480000)	= (4096000)	= (3456000)
	(168000x32)	(152000x32)	(140000x32)	(128000x32)	(108000x32)

F.Cost	(1600000)	(1600000)	(1600000)	(1600000)	(1600000)
Profit (Loss)	<u>416000</u>	<u>832000</u>	<u>920000</u>	<u>1472000</u>	<u>1424000</u>

% profit	= 5.96%	= 12.87%	= 15.13%	= 25.84%	= 28.16%
	(416000)	832000	920000	(1472000)	(1424000)

$$\frac{416000}{(5376000+1600000)} \times 100 = 12.87\% \quad \frac{832000}{(4864000+1600000)} \times 100 = 15.13\% \quad \frac{920000}{(4480000+1600000)} \times 100 = 25.84\% \quad \frac{1472000}{(4096000+1600000)} \times 100 = 28.16\%$$

* INTERNATIONAL TRANSFER PRICING

Meaning of International Transfer Price -

It is an internal price between two country divisions on the basis of mutual understanding and other all the concepts of national transfer price is applicable for international transfer price.

* sum in sheet given

CHAPTER 4 - COST MANAGEMENT TECHNIQUE

* PARETO ANALYSIS .

* sum in sheet given

INTERNATIONAL TRANSFER PRICING

Page No.	
Date	

(EXAMPLE)

9.28

Example

A car manufacturing company has two manufacturing divisions in different countries. Division A in India manufactures engines for the cars. It has a capacity to manufacture 10,000 units each year. The variable cost of production is ₹8,000 p.u. and the division can sell 8,000 engines externally to customers within India at ₹11,000 p.u. The other division, Division B is in Italy that requires 5,000 engines every year to assemble them further into cars. It purchases these engines from a vendor in Italy at a price that is equivalent to ₹9,000 p.u.. If Division B were to purchase these units from Division A, the transfer price would be ₹10,000 p.u. Since no selling expenses need to be incurred on internal sales, variable cost of such transfers would be ₹7,000 p.u. If Division A accepts the internal order from Division B, it will have to curtail some of its external sales.

- Given that the tax rate is 30% in India and 40% in Italy. Determine if the company will benefit overall if Division B purchases from Division A.

GIVEN

A - CAR - MAN - FACT - COMPANY

TWO - DIVISIONS - DIFF COUNTRIES

capacity to manf = 10000 UNITS

- OPTION (I)

10000 NOS

$$V\text{-cost (P-U)} = 8000 \quad \begin{matrix} \text{MANF} \\ 7000 \end{matrix}$$

$$\begin{matrix} \text{SELLING} \\ 1000 \end{matrix}$$

SALES - EXTERNAL

8000 NOS @ 11000/-

DIVISION-B

VENDOR - LOCAL SELL

@ 9000/-

DIVISION-B

5000 NOS @ 10000/-

TAX - FREE = 10%

SAVING IN EXP

**STATEMENT SHOWING ANALYSIS OF
PROPOSAL**

PRODICE	8000 NOS	10000 "
SALES	8000 NOS	5000 "
TRANSFER	-	5000 "
SALES	= 880,00,000 (8000 X 11000)	= 550,00,000 (5000 X 11000)
TRANSFER PRICE	-	500,00,000 (5000 X 10000)
V-COST	(64,00,000) (8000 X 8000)	(4,00,00,000) (5000 X 8000) (350,00,000) (5000 X 7000)
NET-CONTRIBUTION	240,00,000	300,00,000
TAX @ 30%.	(72,00,000)	(90,00,000)
NET INFLOW.	1,68,00,000	2,16,00,000
PURCHASE COST / T.P /	(450,00,000) (5000 X 9000)	(5,00,00,000) (5000 X 10000)
TAX-SAVING	180,00,000 (450,00,000 X 40%)	260,00,000
	(2,70,00,000)	(300,00,000)
	(1,02,00,000)	(90,00,000)

HENCE THE NET AFTER TAX-BENEFIT TO

THE COMPANY $(102,00,000 - 90,00,000)$

$= 12,00,000$ THEREFORE DIVISION 'B' SHOULD

PURCHASE ENGINES INTERNALLY FROM

DIVISION A

PARETO ANALYSIS

Date _____ (b)

STATEMENT SHOWING PARETO ANALYSIS ANALYSIS OF SALES

MODEL	SALES('000)	% (SALES TOTAL SALES) X100	CUMULATIVE TOTAL
(TAB)			
A-001	5100	= 35.05% $(5100 \times 100) / 14550$	35.05%
B-002	3000	= 20.62% $(3000 \times 100) / 14550$	55.67%
C-003	2100	= 14.43% $(2100 \times 100) / 14550$	70.1%
D-004	1800	= 12.37% $(1800 \times 100) / 14550$	82.47%
E-005	1050	= 7.22% $(1050 \times 100) / 14550$	89.69%
F-006	750	= 5.15% $(750 \times 100) / 14550$	94.84%
G-007	450	= 3.09% $(450 \times 100) / 14550$	97.93%
H-008	225	= 1.55% $(225 \times 100) / 14550$	99.48%
I-009	75	= .52% $(75 \times 100) / 14550$	100%
	14550	100%	4.10

ELEMENT SHOWING ANALYSIS OF CONTRIBUTION

MODEL (TAB)	(CONTRIBUTION = SALES X P.V. Ratio)	ROUNDING-OFF 000	RANK
A-001	$(5100 \times 3.53\%) =$ 180	180	⑥
B-002	$(3000 \times 23\%) =$ 690	690	①
C-003	$(2100 \times 14.29\%) =$ 300	300	③
D-004	$(1800 \times 14.17\%) =$ 255	255	④
E-005	$(1050 \times 41.43\%) =$ 435	435	②
F-006	$(750 \times 26.67\%) =$ 195	195	⑤
G-007	$(450 \times 26.67\%) =$ 120	120	⑦
H-008	$(225 \times 6.67\%) =$ 15	15	⑨
I-009	$(25 \times 60\%) =$ 45	45	⑧
		<u>2235</u>	
	9.11	CONTINUE.....	

CONTINUE ---

Date: [] [] []

STATEMENT SHOWING CONTRIBUTION ANALYSIS
(PARETO)

CUMULATIVE

MODEL	MODEL	CONTRIBUTION	(CONTRIBUTION) TOTAL (%)	(X100%).
(2)		600		
(1)	B-002	690	$\frac{690}{2235} \times 100$	= 30.87% 30.87%
(2)	E-005	435	$\frac{435}{2235} \times 100$	= 19.47% 50.44%
(3)	C-003	300	$\frac{300}{2235} \times 100$	= 13.42% 63.76%
(4)	D-004	255	$\frac{255}{2235} \times 100$	= 11.41% 75.17%
(5)	F-006	195	$\frac{195}{2235} \times 100$	= 8.73% 83.90%
(6)	A-001	180	$\frac{180}{2235} \times 100$	= 8.05% 91.95%
(7)	G-007	120	$\frac{120}{2235} \times 100$	= 5.36% 97.32%
(8)	I-009	45	$\frac{45}{2235} \times 100$	= 2.01% 99.33%
(9)	H-008	15	$\frac{15}{2235} \times 100$	= 0.67% 100%
		2235		
		14.12		

CASE STUDY No.....**Learning Curve****Chapter 12. LEARNING CURVE THEORY****CASE STUDY No.....**

A company has 10 direct workers, who work for 25 days a month of 8 hours per day. The estimated down times 25% of the total available time. The company received an order for a new product. The first unit of the new product requires 40 direct labour hours to manufacture the product. The company expects 80% (index is -0.322) learning curve for this type of work. The company uses standard absorption costing and the cost data are as under:

Direct materials	Rs. 60 per unit
Direct labour	Rs. 6 per direct labour hour
Variable overheads	Rs. 5 per direct labour hour
Fixed overheads	Rs. 7,500 per month.

(i) Calculate the cost per unit of the first order of 30 units.

(ii) If the company receives a repeat order for 20 units, what price will be quoted to yield a profit of 25% on selling price?

Q1

An electronics firm which has developed a new type of fire-alarm system has been asked to quote for a prospective contract. The customer requires separate price quotations for each of the following possible orders:

Order	Number of fire-alarm systems
First	100
Second	60
Third	40

CASE STUDY No.**Learning Curve**

The firm estimates the following cost per unit for the first order:

Direct materials - Rs. 500

Direct Labour -

Dept. A (Highly automatic) 20 hours at Rs. 10 per hour.

Dept. B (Skilled labour) 40 hours at Rs. 15 per hour.

Variable overheads 20% of direct labour

Fixed overheads absorbed:

Dept. A Rs. 8 per hour

Dept. B Rs. 5 per hour

Determine a price per unit for each of the three orders, assuming the firm uses a mark up of 25% on total costs and allows for an 80% learning curve.

Extract from 80% Learning curve table:

X	1.0	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Y(%)	100.0	91.7	89.5	87.6	86.1	84.4	83.0	81.5	80.0

x represents the cumulative total volume produced to date expressed as a multiple of the initial order.

Y is the learning curve factor, for a given X value, expressed as a percentage of the cost of the initial order.

Learning Curve

CASE STUDY No....

CYZ Co., has observed that a 90% learning curve ratio applies to all labour related costs each time a new model enters production. It is anticipated that 320 units will be manufactured during 1999. Direct labour cost for the first lot of 10 units amounts to 1,000 hours at Rs. 8 per hour. Variable overhead cost is assigned to products at the rate of Rs. 2 per direct labour hour. You are required to determine :

- i) Total labour and labour-related costs to manufacture 320 units of output.
- ii) Average cost of (a) the first 40 units produced (b) the first 80 units, (c) the first 100 units. -
- iii) Incremental cost of (a) units 41 – 80 and (b) units 101 – 200.

(12.59)

CASE STUDY No....

~~8~~
a8

Learning Curve

XYZ & Co. has given the following data:

80% Average — Time Curve

Cumulative Units (X)	Average Hours	Total Hours	Marginal Hours
1	100	100	100
2	80	160	60
3	?	?	?
4	64	256	?

Required : Fill in the blanks.

C.S.-99
A customer has asked your company to prepare a bid on supplying 800 units of a new product. Production will be in batches of 100 units. You estimate that costs for the first batch of 100 units will average Rs. 100 a unit. You also expect that a 90% learning curve will apply to the cumulative labour cost on this contract.

Required :

- (a) Prepare an estimate of the labour costs of fulfilling this contract.
- (b) Estimate the incremental labour cost of extending the production run to produce an additional 800 units.
- (c) Estimate the incremental labour cost of extending the production run from 800 units to 900 units.

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12.60

CHAPTER 11 & CHAPTER 8Budgetary ControlPERFORMANCE EVALUATION

Meaning of Budgets :

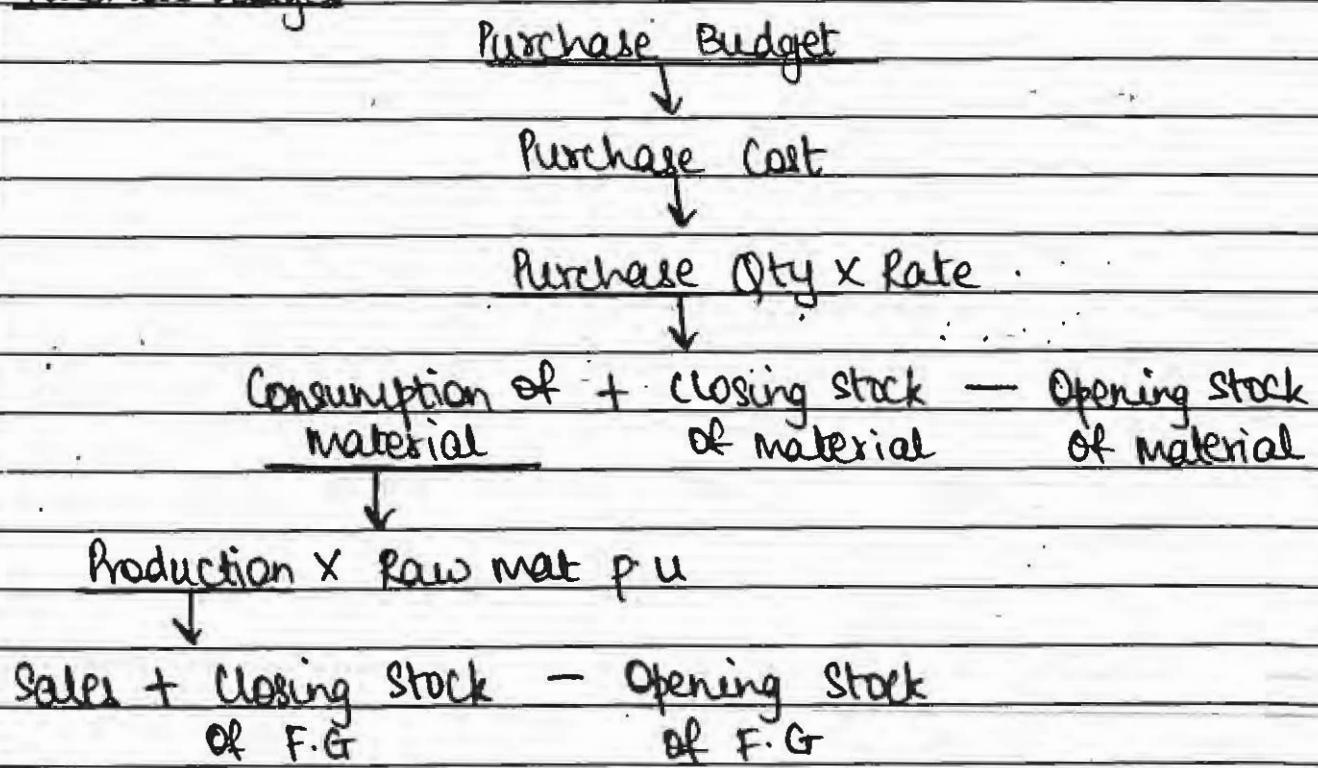
↳ New syllabus

It is a statement which is showing future estimates.

* Types of Budgets —

- 1) Sales Budget
- 2) Production Budget
- 3) Consumption or Usage Budget
- 4) Purchase Budget
- 5) Labour Budget
- 6) Expense Budget
- 7) Flexible Budget
- 8) Any other Budget as per management requirement

** Purchase Budget :



* INTERNATIONAL TRANSFER PRICING

Meaning of International Transfer Price -

It is an internal price between two country divisions
on the basis of mutual understanding and other all the concepts of national transfer price is applicable for international transfer price.

* Sum in sheet given

CHAPTER 4 — COST MANAGEMENT TECHNIQUE

* PARETO ANALYSIS .

* Sum in sheet given

(3) Statement Showing Purchase Budget:

Consumption	=	320000 kg
+ Closing Stock	=	5000 kg
- Opening Stock	=	(10000) kg

315000 kg

<u>Quarter</u>	<u>Raw mat purchased</u>	<u>x Price</u>
I	$315000 \times 30\% = 94500$	$94500 \times 2 = 189000$
II	$315000 \times 50\% = 157500$	$157500 \times 3 = 472500$
III	$315000 \times 20\% = 63000$	$63000 \times 4 = 252000$
		<u>913500</u>

(4) Statement showing Priced stores ledger (FIFO)

Quarter	PURCHASES			ISSUED			CLOSING STOCK		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
I	94500	2	189000	10000 (Op Stock)	2	20000 (Given)	41500	2	83000
				53000 (Bal)	2	106000			
II	157500	3	472500	41500	2	83000	122500	3	367500
				35000	3	105000			
III	63000	4	252000	84000	3	252000	38500	3	115500 252000
							63000	4	
IV	—	—	—	38500	3	115500	5000	4	20000
				58000	4	232000			

Meaning of Flexible Budget

It is a statement which is showing different cost at different volumes.

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Statement Showing Flexible Budget

	70%	80%	90%	100%
Hours	7000	8000	9000	10000
V. cost	= 1260 $(\frac{1260 \times 8000}{7000})$	= 1440 $(\frac{1260 \times 9000}{7000})$	= 1620 $(\frac{1260 \times 10000}{7000})$	= 1800
Semi-Var	= 1200 $(\text{upto } 80\%)$	= 1200 $(1200 + 10\%)$	= 1320 $(1200 + 20\%)$	= 1440
Fixed	= 1800	= 1800	= 1800	= 1800
Total Cost	4260	4440	4740	5040
÷ Hrs	÷ 7000	÷ 8000	÷ 9000	÷ 10000
= Cost per hr	= 0.61	= 0.56	= 0.53	= 0.50

Chapter 8 —

~~Application of Flexible Budget in Performance Analysis~~

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Statement showing Performance Evaluation (Flexible Budget)

Particulars	Nature of Exp	Budget Cost → 6000 units	Actual Cost → 6000 units	Variation
1) Salary	Fixed	1000	1000	0
2) Indirect labour	Variable	540 $(720 \times 6000) / 8000$	600	(60)
3) Ind material	variable	600 $(800 \times 6000) / 8000$	700	(100)
4) Rep & maint	semi-var ①	550	600	(50)
5) Power	semi-var ②	725 $(900 \times 6000) / 8000$	740	(15)
6) Tools	variable	240 $(300 \times 6000) / 8000$	300	(60)
7) Rates & Tax	Fixed	150	150	0
8) Depn	Fixed	800	800	0
9) Insurance	Fixed	100	100	0
10) Bonus				(285)

- * The above analysis clearly shows that there is a loss of Rs 285 as workers are not entitled to get any bonus.

Q) Repair & maint.

$$\text{v. cost p.u} = x$$

$$\text{f. cost} = y$$

$$8000x + y = 600$$

$$10000x + y = 650$$

$$-2000x = -50$$

$$x = 0.025$$

$$(8000)x 0.025 + y = 600$$

$$\therefore y = 400$$

For 6000 units,

$$(6000 \times 0.025) + 400 \\ = \underline{550}$$

Power

$$\text{v. cost p.u} = x$$

$$\text{f. cost} = y$$

$$8000x + y = 800$$

$$10000x + y = 875$$

$$-2000x = -75$$

$$x = 0.0375$$

$$(8000) \times 0.0375 + y = 800$$

$$y = 500$$

For 6000 units,

$$(6000 \times 0.0375) + 500 \\ = \underline{725}$$

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JIT Ltd

WIP Control A/c

Particulars	Nov	Dec	Particulars	Nov	Dec
To op Bal	36000	55100	By FG Control	109000	114800
To direct mat wage	5000	56000			
To direct lab	53100	69000			
To var OH's	25000	29000	By bal c/f	55100	94300
	<u>164100</u>	<u>209100</u>		<u>164100</u>	<u>209100</u>

FG A/c

Particulars	Nov	Dec	Particulars	Nov	Dec
To op Bal	44000	(30000)	By cost of goods sold	123000	99800
To WIP Control	109000	114800			
			By bal c/f	30000	45000
	<u>153000</u>	<u>144800</u>		<u>153000</u>	<u>144800</u>

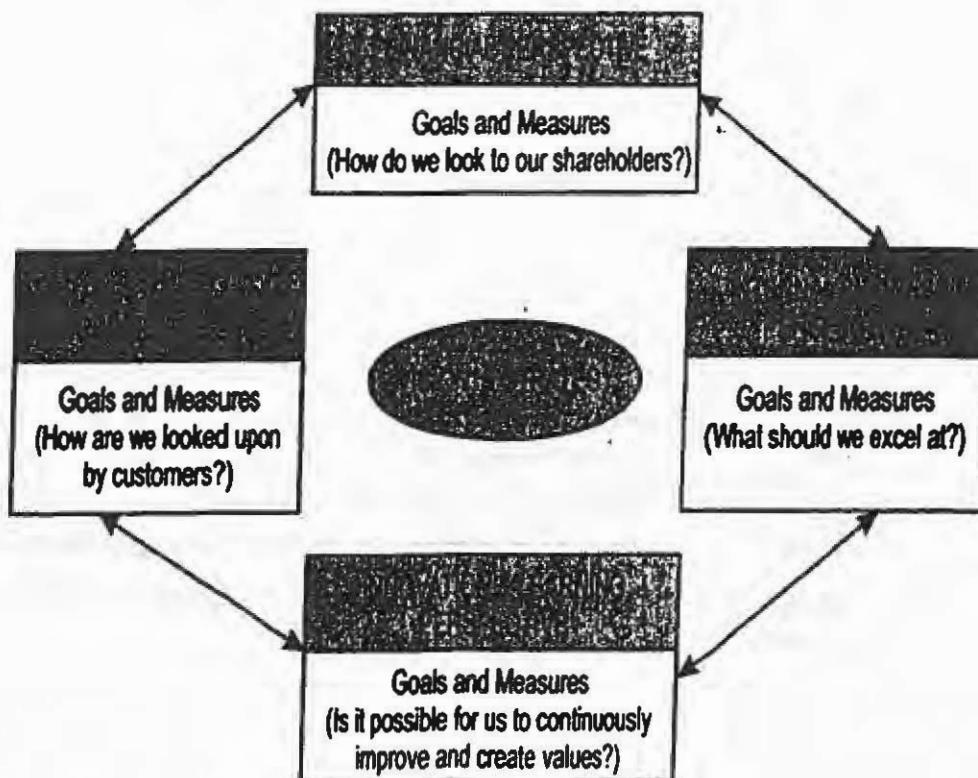
Balanced Scorecard

The Balanced Scorecard can be defined as 'an approach to the provision of information to management to assist strategic policy formulation and achievement. It emphasizes the need to provide the user with a set of information, which addresses all relevant areas of performance in an objective and unbiased fashion. The information provided may include both financial and non-financial elements, and cover areas such as profitability, customer satisfaction, internal efficiency and innovation'.

It is clear from the above definition that the central idea of the Balanced Scorecard is that managers should develop the measures on which they manage the business from four different perspectives:

- (i) Customer Perspective i.e. customer satisfaction.
- (ii) Internal Business Perspective
- (iii) Learning and growth perspective
- (iv) Financial Perspective e.g., operating income by segments.

The following figure summarises the ideas of a Balanced Scorecard:



Balanced Scorecard

In today's business environment information becomes a vital element and to gain competitive advantage over the peers, it cannot be denied. In this era of information age competition, a company cannot survive just by injecting huge capital investment in new technology for physical assets only or by excellent management of financial assets and liabilities. In this information age both manufacturing and service organisation needs new capabilities for competitive success. Merely investing in and managing physical, tangible assets is not enough but an organisation must be able to mobilise and exploit its intangible or invisible assets which in turn becomes a decisive factor.

Intangible assets enable an organisation to:

- Maintain and further development in customer relationships to retain loyalty of existing customers and to serve new market/ customer segments effectively and efficiently.
- Introduce products and services as per the desire of targeted customer and market segments.
- Produce customised high-quality products and services economically with short gestation periods.
- Mobilise employee skills and motivation for better and consistent deliberation in process capabilities, quality, and response times.
- Deploy information technology, data bases and effective management information systems.

The balanced scorecard is a method which displays organisation's performance into four dimensions namely financial, customer, internal and innovation. The four dimensions acknowledge the interest of shareholders, customers and employees taking into account of both long-term and short-term goals.

Kaplan and Norton classified performance measures into four business 'perspectives':

- (i) The financial perspective
- (ii) The customer perspective
- (iii) The internal business perspective
- (iv) The learning and growth perspective

Financial Perspective: "How Do We Look To Shareholders?" In this step manager of a division or a unit, links its business objectives to the corporate strategy of the company as a whole. Financial performance measures indicate whether the company's strategy implementation and execution are contributing to its revenue and earnings. To identify key performance measures in this perspective, managers, during strategic planning ask "How do we look to shareholders?"

Corporate strategy and strategic initiatives are examined from the financial perspective to see feasibility of these initiatives of being met. The financial objectives chosen at the onset of the balanced scorecard implementation should serve two purposes:

- To provide definite performance that was expected at the time of strategies selection.
- To provide a focus for objectives and appropriate measures in each of the other three perspectives.

Customer Perspective: "How Do Customer View Us?" In this stage, companies identify customers and market segments in which they compete and also the means by which they provide value to these customers and markets. Managers identify the lead indicators which make a particular business unit or product different from that of others. Lead indicator may vary from customer to customer or market segment. If for example, a customer values on-time delivery then on-time delivery becomes a lead indicator. Examples of lead indicators may include any number of customer considerations, including:

- On-time delivery
- On-site service
- After sales support
- Defects per order
- Cost of the product
- Free shipments etc.

By delivering quality as per the customer demand and need, business units can improve outcome measures such as customer satisfaction, retention, acquisition and loyalty.

Internal Business Perspective: "At What Must We Excel?" In this stage companies identify processes and activities which are necessary to achieve the objectives as identified at financial perspectives and customer perspective stage. These objectives may be achieved by reassessing the value chain and making necessary changes to the existing operating activities. If maintaining net earnings is the financial objective of a company and after sales service can increase customer retention, then internal business perspective needs to improve after sales services to satisfy customer requirements to maintain net earnings. This objective may be achieved by providing for example toll free customer help lines, setting up service centres in all major cities.

Learning and Growth Perspective: "How Do We Continue To Improve And Create Value?" In the learning and growth perspective, Companies determine the activities and infrastructure that the company must build to create long term growth, which are necessary to achieve the objectives set in the previous three perspectives. Organisational learning and growth comes from three principle sources:

- People i.e. employee capabilities
- Systems i.e. information system capabilities and
- Organisational procedures i.e. motivation, empowerment and alignment.

Since, the balanced scorecard is intended to improve long-term performance, managers may invest in resources needed in the short-run but this should not affect business unit's performance.

The ultimate result of using the Balanced Scorecard approach should be an improved long term financial performance. Since the scorecard gives equal importance to the relevant non-financial measures, it should discourage the short termism that leads to cuts in spending on new product development, human resource development etc which are ultimately detrimental for the future prospects of the company.

The responsibility to devise and implement a Balanced Scorecard should be that of the managers working with the business. Since every company is different, it shall need to work out for itself the various financial and non-financial measures, which need to be focused upon for its own development. Since the Balanced Scorecard is recommended as a management tool used both for internal and external reporting purposes, it is again the manager's responsibility to decide as to what information needs to be disclosed and how any problems of confidentiality can best be overcome.

The following are some reasons why Balanced Scorecards sometimes fail to provide for the desired results;

- Managers mistakenly think that since they already use non-financial measures, they already have a Balanced Scorecard.
- Senior executives misguidedly delegate the responsibility of the Scorecard implementation to middle level managers.
- Company's try to copy measures and strategies used by the best companies rather than developing their own measures suited for the environment under which they function.
- There are times when Balanced Scorecards are thought to be meant for reporting purposes only. This notion does not allow a Business to use the Scorecard to manage Business in a new and more effective way.

It may be noted that the above-mentioned difficulties refer to the internal use of the Scorecard, unless it is used internally successfully, it should not be used as a basis for external reporting.

The following figure summarises the ideas of a Balanced Scorecard:

CASE- STUDY- 14

Case Scenario

History of the Company

Great Bus Tours Co. Ltd. (GBTCL) is an open top double-decker bus sightseeing company, particularly identified with its special red and cream-colored buses. It commenced operating in small town of Meghalaya in June 2013 with four buses and as of 2017 operated over 44 buses in north east region of India. GBTCL operates five routes with stops at tourist destinations. The company runs hop-on, hop-off bus tours of various hills, with one 24-hour ticket valid for unlimited journeys on the route.

Budget Process/ Incentive Plan

As a part of management performance control and incentive scheme it has been following participative budgeting approach. In GBTCL, budgeting is a joint process in which functional divisions develop their plans in conformity with corporate goals for the next financial year. Based on these plans, divisions prepare functional budgets and send to the appropriate management for review and approval. The budgets after the incorporation of the feedback and suggestions received from the said management, are finalised for the implementation. Then, finalised budgets are used as yardstick for performance measurement. Comparing the actual performance with the yardstick, bonus and other performance related incentives are considered. The higher management believe that this performance control and incentive scheme is very helpful to measure the performance and fixing responsibilities for the responsibility centres.

Budgeted Income Statement (₹'000)

Revenue	1,13,800
<i>Less:</i>	
Variable Costs-	
<i>Direct Material (Fuel, Lubricants and Sundries)</i>	13,600
<i>Direct Labour</i>	40,500
<i>Variable Overheads</i>	7,700
Fixed Costs-	
<i>Operating Overheads (Buses, Garage, Salaries)</i>	18,100
<i>Marketing and Administration</i>	10,700
Profit/ (Loss) before taxes	23,200

Table-1

Current Year's Income Statement(₹'000)

Revenue	93,500
<i>Less:</i>	
Variable Costs:	
<i>Direct Material (Fuel, Lubricants and Sundries)</i>	19,600
<i>Direct Labour</i>	37,700
<i>Variable Overheads</i>	6,200
Fixed Costs:	
<i>Operating Overheads (Buses, Garage, Salaries)</i>	20,150
<i>Marketing and Administration</i>	10,100
Profit/ (Loss) before taxes	(250)

Table-2

Other Information

Surprisingly above given current year's actual results were not up to the mark. Actual results were clearly showing adverse performance in comparison with budgeted figures.

Managers of GBTCL were upset because they did not receive the bonus. Ms. Maggie, Tour Manager of Route No. 3, said –

"We lost 2 months revenue and fuel prices are almost doubled. We did our best but these circumstances were beyond our control and we should not penalize at all."

In support of her statement, Ms. Meggle provided following additional information –

- (a) *Rain is common in Northern Region. But, the past year set a record in numbers. In July the expected average was 1,577 mm and received was 1,810 mm, In August the expected average rain was 990 mm and actual received was 1,535 mm. Heavy rain in these two months disrupted normal life of the region.*
- (b) *The fuel prices has risen almost continuously since last year due to surge in global crude prices.*
- (c) *Additional operational expenses ₹22,00,000 also incurred to remove the milky appearance and give the stainless a nice new look effected by heavy rain.*

She claimed that –

"Revised budget with consideration of the above factors would give different results and lead to different conclusions"

Required

ANALYSE the tour manager's view.

STATEMENT SHOWING ANALYSIS OF PROFIT & LOSS

	BUDGETED	RECORDED ACTUAL	ADJUSTED BUDGET
REVENUES	113800	93,500	= 94833 $(\frac{113800 \times 10}{12})$
<u>VARABLE COST</u>			
SREG - MATERIAL	(13600)	(9600)	= (19879) $(\frac{19600 \times 9483}{93500})$
VEL, LUBRICANTS & SPARES			
DIRECT LABOUR	(40500)	(37700)	= (33250) $(\frac{40500}{113800} \times 9483)$
VARIABLE OVERHEADS	(7700)	(6200)	= (6417) $(\frac{7700}{113800} \times 9483)$
<u>FIXED COST:-</u>			
OPERATING OVERHEADS (BUSES, GARAGE, SALARIES)	(18100)	(20150)	= (20300) $(18100 + 2200)$
MARKETING & ADMIN	(10700)	(10100)	= (10700)
P.B.TAX/(LOSS)	23200	(250)	3787
PROFIT (%)	$\left(\frac{23200}{113800} \right) \times 100$ $= 20.38\%$ Say <u>20%</u> .		$\left(\frac{3787}{94833} \right) \times 100$ $= 3.99\%$ Say <u>4%</u> .
		11.5	

The Revised Profit Margin has come down to 4% as against the Target Profit Margin of 20%. This clearly indicates that the performance was benchmarked against the higher target. If original budget figure is used to measure the performance, it will punish employees for the reason which are beyond their control.

GBTCL is not too far away from Revised Profit Margin. Therefore, at least some bonus may be considered to be awarded to the employees which may create more employee loyalty and may be beneficial for long term.

Further, continuous monitoring of Budget Performance (achievement/ failure) in GBTCL is essential to overcome this situation. This helps to identify where revisions are required in the budget to account changing conditions, errors, modification to company's plan etc. Monitoring of Budget Performance should be the responsibility of the managers in GBTCL. The essence of the effective monitoring of Budget Performance is that the managers should provide accurate, relevant, actionable information on time to the appropriate management level so that budget can give a realistic target to measure the performance.

It is also important to note that at the time of revising the budget, the primary budget as well as past information should not be ignored as they are the basis for preparing all budgets.

CASE - STUDY-15

Case Scenario

Real Petroleum Corporation manufactures lubricant oils for motor vehicles (two wheelers, four wheelers and heavy vehicles). The company offers lubricant oils in various packages ranging from a 100 ml pouch to a 200 litres drum. About 70% of lubricant sales comprise are made in the form of 900 ml 'cans'. The process of manufacturing and packaging lubricant oils are given below:

- Base oil of required grade are imported from middle east.
- The base oil are blended with additives at the manufacturing plants at specified temperatures to produce lubricant oils.
- The oil is stored for a day to bring the temperature to normal.
- The plant has an automated bottling facility. The operator is required to preset the quantity and number of 'cans' to be filled in a computerised system. No manual intervention is required thereafter.
- The product is filled in 'cans' at the first stage of packaging with 900 ml of product.
- Caps are fixed on the 'cans' and sealed at the second stage of packaging.
- The product is weighed at third stage of packaging (a conversion factor is used to cover volume into weight) before the 'cans' are packed into a carton.

Any 'can' having lesser quantity of oil is removed before the 'cans' are packed into the cartons. The 'cans' which are short filled cannot be reused. Once the seal is broken, the 'can' is of no use. There is no process by which the oil in short filled 'can' could be reused. Hence the product is wasted.

The company is considering a proposal to add a component in its packaging unit to avoid losses arising out of quantity issues in packaging. The component will be installed after the first stage of packaging. The component will measure the volume of product and will forward the 'can' for capping and sealing only if the quantity in 'cans' is correct. In case the 'can' does not have required volume of product, the 'can' will be topped up with balance product before the capping and sealing process. The company will be able to achieve 0% wastage due to short filling after implementation of new system.

Required

Using the context of control systems, IDENTIFY and EXPLAIN the type of control which is existing in the company and the type of control which is proposed.

Solution

What is Control?

Control is a management function of establishing benchmarks and comparing actual performance against the benchmarks and taking corrective actions. Control is required at all levels of organisation to ensure that the organisation achieves its intended objective. There are two types of control systems - Feedback Control and Feed-forward Control.

Feedback Control

Feedback Control is a control activity that takes place after a process is complete. It is also known as post action control. If any problem is identified after a process is complete, a corrective action is taken to rectify the problem. Feedback control provides information only after the process is complete and sometimes a significant time is lost to take corrective action. Feedback-based systems have the advantage of being simple and easy to implement.

Real Petroleum currently has a feedback control mechanism in place. The actual volume of the product is measured at the end of the packaging process. The current control process is that any 'can' which is short filled is not packed in the carton. This ensures that a lower quantity of product is not supplied into the market. The current control system, however leads to product losses as identification of short-filled 'cans' at the end of process is not useful to the production process. In case, there is a huge variation in the final packaging, the packaging system can be reviewed to ensure that such problems do not acquire in the future.

Feed-forward Control

Feed-forward Control is also referred to as a *preventive control*. The rationale behind feed-forward control is to foresee potential problems and take corrective action to ensure that the final output is as expected. Feed-forward controls are desirable because they allow management to prevent problems rather than having to cure them later. Feed-forward control are costly to implement as it requires additional investment and resources. These are designed to detect deviation from some standard or goal to allow correction to be made before a particular sequence of actions is completed.

The proposed system in Real Petroleum is a Feed-forward control. In this case, any short filling is identified in the packaging process itself and corrective action is taken to ensure that the final packed 'can' has proper quantity of product. The new process is beneficial to the company as the wastage arising out of the packaging process can be avoided. The savings must be compared with the cost required to modify the packaging process before finalising on whether the new system should be implemented or not.

CASE STUDY No. 8**THROUGHOUT ACCOUNTING**

Vikram Ltd. produces 4 products using 3 different machines. Machine capacity is limited to 3,000 hours for each machine. The following information is available for February 2009:

Products	A	B	C	D
Contribution (Sales - Direct Material)	1,500	1,200	1,000	600
Machine hours required/unit:				
Machine 1	10	6	2	1
Machine 2	10	9	3	1.5
Machine 3	10	3	1	0.5
Estimated Demand (units)	200	200	200	200

From the above information, you are required to identify the bottleneck activity and allocate the machine time.

CASE STUDY No. 9**Illustration**

A company produces 3 products A, B and C. The following information is available for a period.

	Production		
	A	B	C
Contribution (Sales – Direct Materials)	Rs. 24	Rs. 20	Rs. 12
Machine hours required per			
Machine 1	12	4	2
Machine 2	18	6	3
Machine 3	6	2	1
Estimated sales demand	200	200	200

It is given that machine capacity is limited to 3,200 hours for each machine, you are required to analyze the above information and apply TOC process to remove the constraint.

★ Application of Balanced Score Card in Performance Evaluation

- tee sheet (Theory)

CHAPTER-5

CASE STUDY

* CONCEPT OF THROUGHPUT / THROUGHPUT
THEORY OF CONSTRAINTS (TOC) ACCOUNTING
(sheet)

Case Study 'C'

(a) Statement showing cont p.u/p.m & rank:

	W	X	Y	Z
SP (pu)	56	67	89	96
- Mat	(22)	(31)	(38)	(46)
- Labour	(15)	(20)	(18)	(24)
- Var OH ^s	(12)	(15)	(18)	(15)
Cont	7	1	15	11
÷ min	÷ 10	÷ 10	÷ 15	÷ 15
⇒ Cont pu	= 0.7	= 0.1	= 1.00	= 0.733
Per min				
Rank	III	IV	I	II

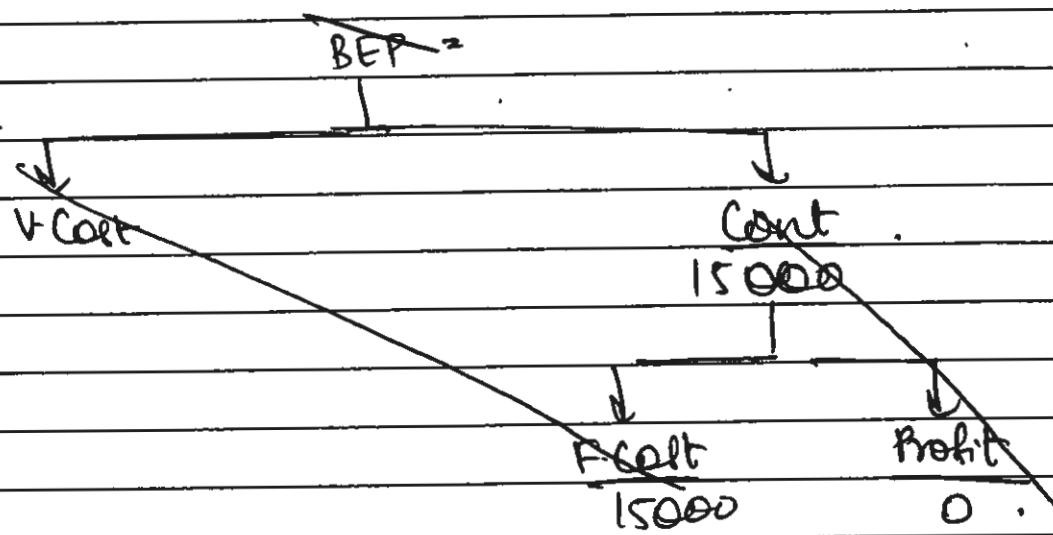
(b) $W : X : Y : Z$
 $2 : 3 : 3 : 4$

Avg Cont p.u.

	<u>W</u>	X	Y	Z
Cont (p.u.)	7	1	15	11
X Regd ratio	$\times 2$	$\times 3$	$\times 3$	$\times 4$
	= 14	= 3	= 45	= 44

Total Sales

$$\text{Avg Cont p.u.} = \frac{14 + 3 + 45 + 44}{2 + 3 + 3 + 4} = \frac{106}{12} = \underline{\underline{8.83 \text{ p.u.}}}$$



$$BEP = 15000$$

8.83

$$= 1698.75$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

W	X	Y	Z
2	3	3	4

$$283.12 \quad 424.68 \quad 424.68 \quad 566.25$$

- * If in the Q the language is used like —
 Throughout a/c, throughout a/c, theory of
 constraint then only for rank for prodn, ~~etc~~
 * Contribution = S.P - Only mat. cost

(c) Statement showing cont p.u / per min & rank.

	W	X	Y	Z
S.P (p.u)	56	67	89	96
- mat	(22)	(31)	(38)	(46)
cont	34	36	51	50
÷ min	÷ 10	÷ 10	÷ 15	÷ 15
cont pm	= 3.4	= 3.6	= 3.4	= 3.33
Rank	II	I	IV	III

Case Study 'b'Statement showing calculation of cont. limiting factor

Machine	A	B	C	Total Hrs	Total hrs	(Shortage)
	Req'd	Avail				Surplus
M1	= 2400 (200x12)	= 800 (200x4)	= 400 (200x2)	3600	3200	(400)
M2	= 3600 (200x18)	= 1200 (200x6)	= 600 (200x3)	5400	3200	(2200)
M3	= 1200 (200x6)	= 400 (200x2)	= 200 (200x1)	1800	3200	1400

Constraint: M2 because maximum shortage.

1) Statement showing cont p.u | p.hr & rank

	A	B	C
Cont (p.u)	24	20	12
÷ hrs p.u	÷ 18	÷ 6	÷ 3 (only M2)
Cont p.hr	= 1.33	= 3.33	= 4
Rank	III	II	I

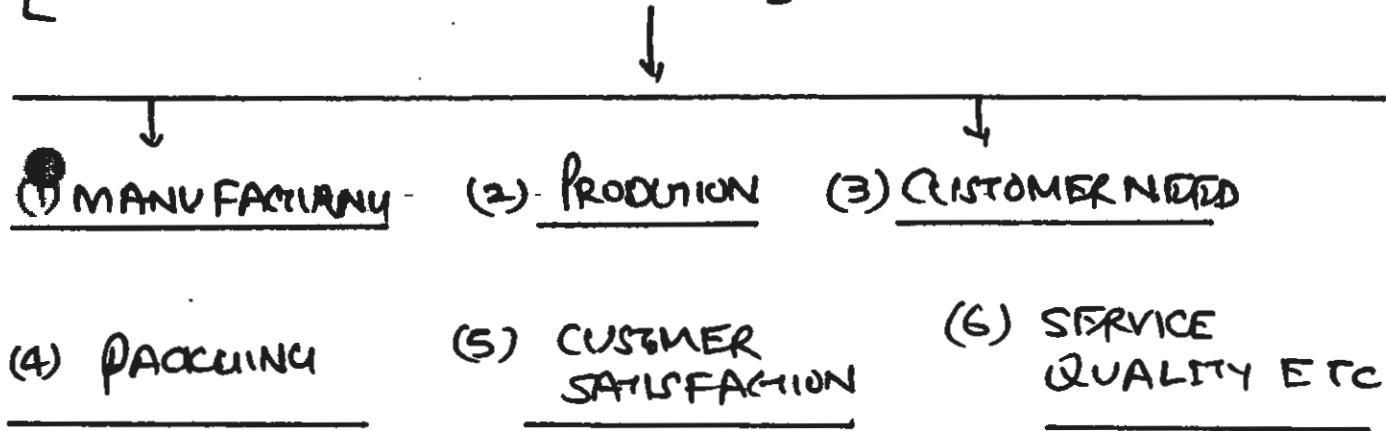
2) Statement showing prodn plan

Hrs.	Products	Units x hrs p.u = Total	Balance
3200	C	200 x 3 = 600	(3200 - 600)
2600	B	200 x 6 = 1200	(2600 - 1200)
1400	A	200 x 18 = 3600	—

[KAIZEN - COSTING]

KAI - ZEN
↓ ↓
CHANCE FOR-BETTER

[CONTINUOUS - IMPROVEMENT]



Kaizen Costing Principles

- The system seeks gradual improvements in the existing situation, at an acceptable cost.
- It encourages collective decision making and application of knowledge.
- There are no limits to the level of improvements that can be implemented.
- Kaizen involves setting standards and then continually improving these standards to achieve long-term sustainable improvements.
- The focus is on eliminating waste, improving systems, and improving productivity.
- Involves all employees and all areas of the business.

CASE-STUDY-(1)

	NO - KAIZEN	YES - KATZEN
CASE-STUDY	BAIDY NATH	PATANJALI
PATENTS	750	350
YEARS (EXP)	100 YEARS	10 YEARS
BUSINESS	AYURVEDA	AYURVEDA
TURNOVER	750 CR	10500 CR
FOCUS ON F.M.C.G.	NO	YES
	TOOTH PASTE	DANTKRANTI
	BOURNVITA	POWERVITA
IMPROVEMENT IN PACKAGING	NO JADI-BITE	YES F.M.C.G.
	NO-CHANGE-OVER TIME	CONTINUOUS IMPROVEMENT
	NO IMPROVEMENT IN-CUSTOMER NEED	IMPROVE CUSTOMER NEED
	NOKIA PHONE	SAMSUNG PHONE
	KODAK	NIKON (DSLR)
	ONIDA (T.V.)	SONY (L.C.D.)
	3.8	

CASE - STUDY - 2

Kaizen Costing in Practice

Kaizen Costing becomes part of the Package At the start of 2002 a UK company called Kappa Packaging (now part of the Smurfit Kappa Group) had a factory in Greater Manchester that made, among other products, cartons to hold bottles of drink. That year the firm introduced a new approach to cutting the amount of waste paper and cardboard it was producing, which stood at 14.6 per cent of the raw materials consumed. The new approach included the following initiatives:

- a) Making employees more aware of how much waste was being produced.
- b) Requiring them to monitor the amount of waste for which they were individually responsible.
- c) Establishing a Kaizen team to find ways of reducing waste.

As a result, Kappa was able to reduce waste from 14.6 per cent to 13.1 per cent of raw materials used by the end of 2002 and down to 11 per cent in 2003. Each percentage-point saving was worth an estimated £110,000 a year.

(Source: "Accurate measurement of process waste leads to reduced costs", www.environwise.gov.uk, 2003.)

(CASE - STUDY - 3)

Case Scenario

M. India Ltd. (MIL) is an automobile manufacturer in India and a subsidiary of Japanese automobile and motorcycle manufacturer Leon. It manufactures and sells a complete range of cars from the entry level to the hatchback to sedans and has a present market share of 22% of the Indian passenger car markets. MIL uses a system of standard costing to set its budgets. Budgets are set semi-annually by the Finance department after the approval of the Board of Directors of MIL. The Finance department prepares variance reports each month for review in the Board of Directors meeting, where actual performance is compared with the budgeted figures. Mr. Suzuki, group CEO of the Leon is of the opinion that Kaizen costing method should be implemented as a system of planning and control in the MIL.

Required

RECOMMEND key changes vital to MIL's planning and control system to support the adoption of 'Kaizen Costing Concepts'.

Solution

Kaizen Costing emphasizes on small but continuous improvement. Targets once set at the beginning of the year or activities are updated continuously to reflect the improvement that has already been achieved and that are yet to be achieved.

The suggestive changes which are required to be adopted Kaizen Costing concepts in MIL are as follows:

Standard Cost Control System to Cost Reduction System: Traditionally Standard Costing system assumes stability in the current manufacturing process and standards are set keeping the normal manufacturing process into account thus the whole effort is on to meet performance cost standard.

On the other hand Kaizen Costing believes in continuous improvements in manufacturing processes and hence, the goal is to achieve cost reduction target. The first change required is the standard setting methodology i.e. from earlier Cost Control System to Cost Reduction System.

Reduction in the periodicity of setting Standards and Variance Analysis: Under the existing planning and control system followed by the MIL, standards are set semi-annually and based on these standards monthly variance reports are generated for analysis. But under Kaizen Costing system cost reduction targets are set for small periods say for a week or a month. So the period covered under a standard should be reduced from semi-annually to monthly and the current practice of generating variance reports may be continued or may be reduced to a week.

Participation of Executives or Workers in standard setting: Under the Kaizen Costing system participation of workers or executives who are actually involved in the manufacturing process are highly appreciated while setting standards. So the current system of setting budgets and standards by the Finance department with the mere consent of Board of Directors required to be changed.

CHAPTER 3 — LEAN SYSTEM & INNOVATION



Kaizen Costing .

CHAPTER 4 — COST MANAGEMENT TECHNIQUES



Life Cycle Costing .

* Meaning of Life Cycle Costing :

It is a modern method for planning of a capital asset with an object of minimized the cost and maximise the profit .

Steps for solving the sum :

- (1) Check whether life cycle cost concept is applicable or not .
- (2) Check status of a person — existing or new .
- (3) Statement showing inflow or outflow per year during the life .
- (4) Final Decision .



Capital Budgeting Sums .

Page 16 - CS - 15

- (1) Yes, life cycle is applicable.
- (2) Existing (taking a decision of replacement)
- (3) Statement showing Inflow / Outflow per year.
Present value of Outflow (Capital Nature):

Year		DF @ 12%	PV
0	Cap Exp (3500000)	x 1	= (3500000)
0	Scrap Value 900000	x 1	= 900000

(2600000).

Present Value of Inflow (Rev. Nature):

Year	Savings	Maint Cost (100%)	Depn (100%)	PBT	Tax	PAT + DEP = Inflow	DF @ 12%	PV
1	1200000	(700000)	(350000)	(300000)	150000	(150000)	3500000	0.89 = 3115000
2	1200000	(700000)	-	500000	(250000)	250000	0.80	2000000
3	1200000	(700000)	-	500000	(250000)	250000	0.71	1775000
4	1200000	(700000)	-	500000	(250000)	250000	0.64	1600000
5	1200000	(700000)	-	500000	(250000)	250000	0.57	1425000
6	1200000	(700000)	-	500000	(250000)	250000	0.51	1275000
						100000	0.51	51000
								2638500

$$\text{Net Present Value (NPV)} = 38500$$

$$(2638500 - 2600000)$$

Years	FV	x C.D.F	PV
1-6	9345	x 4.12	= 38500

(0.89 + 0.80 + 0.71 + 0.64 + 0.57)
+ 0.51

eg: Existing - DKC

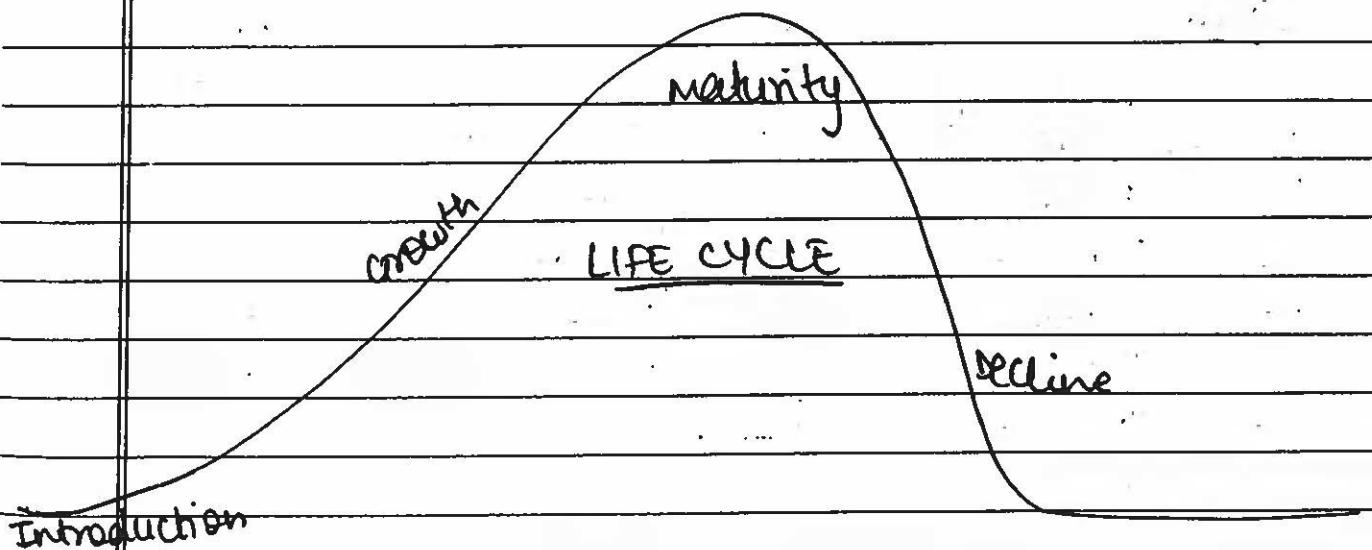
<u>Year</u>	<u>PBT</u>	<u>Tax @ 30%</u>	<u>PAT</u>
1	1000000		

DKC - CD

<u>Year</u>	<u>PBT</u>	<u>Tax @ 30%</u>	<u>PAT</u>
1	(500000)	150000	(350000)
2	(1000000)	(300000)	700000

New DKC - C:D

<u>Year</u>	<u>PBT</u>	<u>Tax @ 30%</u>	<u>PAT</u>
1	(500000)	-	(500000)
2	1000000	(150000)	850000



Page 15 - Q8-14

- (1) Yes
- (2) Existing (Currently bought)
- (3) Statement showing Inflow/Outflow per year.

PV of Outflow (Cap Nature)

Year		DCF@10%	PV
0	Cap Exp	(750000) × 1	= (750000)
0	Working Cap	(50000) × 1	= (50000)
			(800000)

PV of Inflow (Rev Nature)

Year	PBT	Tax	PAT + Dep = Inflow	× CDF @10%	PV
-10	180000	(90000)	90000 + $\frac{750000 -}{10}$ <u>50000</u>		
			$90000 + \frac{70000}{10} = 160000$	× 6.14	= 982400
0	Scrap		50000 × 0.38		-21500 19000
0	w Cap		50000 × 0.38	2	-21500 19000
					<u>1025400</u> <u>1025400</u>

$$\text{NPV} = (1025400 - 800000) = 225400$$

$$\text{NPV} = 225400$$

$$\div 6.14 = 35896 \text{ per yr.}$$

inflow

COST MANAGEMENT TECHNIQUES

LIFE CYCLE COSTING

Illustration

P & G International Ltd. (PGIL) has developed a new product 'a³' which is about to be launched into the market. Company has spent ₹ 30,00,000 on R&D of product 'a³'. It has also bought a machine to produce the product 'a³' costing ₹ 11,25,000 with a capacity of producing 1,100 units per week. Machine has no residual value.

The company has decided to charge price that will change with the cumulative numbers of units sold:

Selling Price (₹)	
0 to 2,200	750
2,201 to 7,700	600
7,701 to 15,950	525
15,951 to 59,950	450
59,951 and above	300

Based on these selling prices, it is expected that sales demand will be as shown below:

Sales Demand (Units)	
1-10	220
11-20	550
21-30	825
31-70	1,100
71-80	880
81-90	660
91-100	440
101-110	220
Thereafter	Nil

Unit variable costs are expected to be as follows:

First 2,200 units	375
Next 13,750 units	300
Next 22,000 units	225
Next 22,000 units	188
Thereafter	225

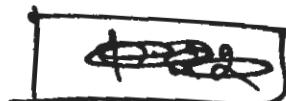
PGIL uses just-in-time production system. Following is the total contribution statement of the product 'a³' for its Introduction and Growth stage:

Weeks	1 - 10		11 - 30
	2,200	5,500	8,250
Selling Price per unit (₹)	750	600	525
Variable Cost per unit (₹)	375	300	300
Contribution per unit (₹)	375	300	225
Total Contribution (₹)	8,25,000	16,50,000	18,56,250

Required

- (i) PREPARE the total contribution statement for each of the remaining two stages of the product's life cycle.
- (ii) DISCUSS Pricing Strategy of the product 'a³'.
- (iii) FIND possible reasons for the changes in cost during the life cycle of the product 'a³'.

Note: Ignore the time value of money.



4-17

IVEN

(ILL-4-29)

1200
TRO DATION
1-10

FUNCTIONS
(220X10)
2200
05=375

NEXT-13750
GROWTH
11-30
11-20 21-30
 $10 \times 550 = 5500$
 $10 \times 825 = 8250$
@ 300 @ 300

MATURITY
31-70
31-50 (51-70)
 $(20 \times 1100) = 22000$
V.COST 225

DECLINE
71-110
71-90 (880×10)
 $= 8800$
81-90 (660×10)
 $= 6600$
91-100 (440×10)
 $= 4400$
10-1-210
 $(220 \times 14) = 2200$
22000
V.COST = 225

STATEMENT SHOWING TOTAL CONTRIBUTION FOR REMAINING
TWO STAGES

Weeks.	MATURITY		DECLINE
	31-50	51-70	71-110
UNITS	22000	22000	22000
S.P(P.U)	450	450	300
V.P(%)	(225)	(188)	(225)
	225	262	75
TOTAL CONT	4950000	5764000	1650000

4.18

B22

(ii) Pricing Strategy for Product a^3

PGIL is following the skimming price strategy that's why it has planned to launch the product a^3 initially with high price tag.

A skimming strategy may be recommended when a firm has incurred large sums of money on research and development for a new product.

In the problem, PGIL has incurred a huge amount on research and development. Also, it is very difficult to start with a low price and then raise the price. Raising a low price may annoy potential customers.

Price of the product a^3 is decreasing gradually stage by stage. This is happening because PGIL wants to tap the mass market by lowering the price.

(iii) Possible Reasons for the changes in cost during the life cycle of the product ' a^3 '

Product life cycle costing involves tracing of costs and revenues of each product over several calendar periods throughout their entire life cycle. Possible reasons for the changes in cost during the life cycle of the product are as follows:

PGIL is expecting reduction in unit cost of the product a^3 over the life of product as a consequence of economies of scale and learning / experience curves.

Learning effect may be the possible reason for reduction in per unit cost if the process is labour intensive. When a new product or process is started, performance of worker is not at its best and learning phenomenon takes place. As the experience is gained, the performance of worker improves, time taken per unit reduces and thus his productivity goes up. The amount of improvement or experience gained is reflected in a decrease in cost.

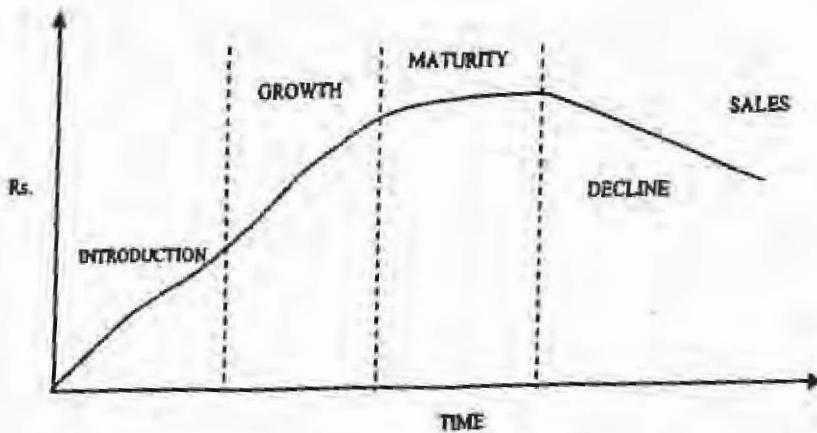
Till the stage of maturity, PGIL is in the expansion mode. The PGIL may be able to take advantages of quantity discount offered by suppliers or may negotiate the price with suppliers.

Product a^3 has the least variable cost ₹188 in last phase of maturity stage; this is because a product which is in the mature stage may require less marketing support than a product which is in the growth stage so, there is a saving of marketing cost per unit.

Again the cost per unit of the product a^3 jumps to ₹225 in decline stage. As soon as the product reaches its decline stage, the need or demand for the product disappear and quantity discount may not be available. Even PGIL may have to incur heavy marketing expenses for stock clearance.

4.19

4.19



STATEMENT SHOWING ANALYSIS OF PROPOSAL

LIFE	MACHINE A	MACHINE-B
	12 YEARS	12 YEARS
YEAR	CAPITAL EXP	(28000)
1-12	ANNUAL PROFIT	(148656)
		(24000 X 6.194)
		(151492)
CS-(7b)		✓

- a. Life Cycle Cost with Time Value of Money
 RTP
 A Company has a choice to purchase either Machine A or B for producing its product. If the Machine has a life of 12 years, and Finance Costs 12% a year, advise which Machine is preferable. The Annuity of 12% Finance Costs for 12 years is 6.194.

Machine	A	B
Initial Cost	₹28,000	₹40,000
Annual Operating Costs	₹24,000 p.a.	₹18,000 p.a.

CS-TCC

Case Study

- Meena is a Marketing Executive working in an automobile company. Her assignment is to develop a feature article on 'Product Life Cycle'. She is consulting her colleagues regarding the interview with the Chief Financial Officers (CFO) and Operations Managers. Meena has been assigned to write an article based on research into the Company's history, operations, and analysis for the coming year. The article will include:
- Requirements:
1. Meena has asked you for recommendations on Industries and Firms that would be good candidates for the article. What would you advise? Explain your recommendations.
 2. Her Colleague was informally chatting with Meena and observed that lower prices would be charged when a product is off demand or old. If a new product version is launched by a Company, in order to get rid of old stock.
 3. Outline the Importance of Product Life Cycle Costing.

Issue 1: Examples of Industries which can be considered for Product Life Cycle (PLC) analysis are –

- Automobile Companies, e.g. Maruti, Honda, Toyota, etc. with Car Model PLC of 5 - 6 years.

• Consumer Durables e.g. Reliance, Tata, Airtel, etc. with Scheme PLC of 1 - 2 years.

4.20

C.S. 7(a)

Life Cycle Costing - New Product Launch Decision

A Company is planning a new product. Market Research information suggests that 40,000 units of the product can be sold at a maximum of ₹ 25 per unit. The Company seeks a minimum mark-up of 25% on Product Cost. It is estimated that the lifetime costs of the product will be under. You are required to advise whether the product be manufactured.

- | | | | |
|--|---------------|--------------------------------|----------|
| • Research and Development, Design Costs | ₹ 1,50,000 | • End of Life Costs | ₹ 70,000 |
| • Manufacturing Costs | ₹ 16 per unit | • Promotion and Capacity Costs | ₹ 20,000 |

STATEMENT SHOWING MINIMUM SALES VALUE

	Rs.
(1) R&D & DEV- DESIGN COST	150,000
(2) MAN-COST (40000×16)	640,000
(3) END OF LIFE COST	70,000
(4) PROMOTION COST	20,000
T.COST	<u>880,000</u>

pt
(25% of 880,000)

MINIMUM SALES VALUE

~~TOPPER PAPER~~ EXP-SALE
 (40000×25)

220,000

1100,000

1000,000

DECISION - NOT WORTH WHILE

8. Life Cycle Costing - Effect of Price Reduction

PGIL has developed a new product "K" which is about to be launched into the market and anticipates to sell 80,000 of these units at a Sale Price of ₹ 300 over the product's life cycle of four years. Data pertaining to product 'K' are as follows:

Costs of Design and Development of Molds, Dies, and Other Tools	₹ 2,25,000
Manufacturing Costs	₹ 125 per unit
Selling Costs	₹ 12,500 per year + ₹ 100 per unit
Administration Costs	₹ 50,000 per year
Warranty Expenses	5 Replacement Parts per 25 units at ₹ 10 per part, 1 Visit per 500 Units (Cost ₹ 500 per visit)

1. Compute Product "K"'s 'Life Cycle Cost'.

2. If PGIL can increase Sales Volume by 25% through 10% reduction in Selling Price, should PGIL choose the lower price?

STATEMENT SHOWING ANALYSIS OF PROPOSAL

	AT- BUDGET	AT-REDUCED PRICE
(A) REVENUES (SALES)	= ₹ 240,00,000 (80000 × 300)	₹ 70,00,000 (80000 × 125) = ₹ 100,00,000 × (300 × 90%)
(B) RELEVANT COST		
(1) COST OF DESIGN & DEVELOPMENT	(8,25,000)	(8,25,000)
(2) MAN COST	100,00,000 (80,000 × 125)	125,00,000 (100,000 × 125)
(3) SELLING COST	50,000 (2,500) × 4	50,000 (2,500) × 4
(4) ADMIN COST	100,00,000 (80,000 × 100)	100,00,000 (100,000 × 100)
(5) WAR. EXP - REF. COST	200,000 (50,000) × 4	200,000 (50,000) × 4
VISIT	(160,000) $\frac{80,000 \times 5 \times 10}{25}$ (80,000) $\frac{80,000 \times 1 \times 500}{500}$	(200,000) $\frac{(80,000 \times 5 \times 10)}{25}$ (100,000) $\frac{(80,000 \times 1 \times 500)}{500}$
PT/LOSS	4685000	3125000
	NOT DESIRABLE	

- Life Cycle Income Statement - Pricing Decision
 Startup Ltd provides the following details on its new product.

C.S. 7(+)

Years 1 and 2: R & D Costs: ₹ 2,40,000, Design Costs ₹ 1,60,000

Years 3 to 6: Other Functional Costs:

Function	One-Time Costs	Costs per unit
Production	₹ 1,00,000	₹ 25
Marketing	₹ 70,000	₹ 24
Distribution	₹ 50,000	₹ 16
Customer Service	₹ 80,000	₹ 30

The sale quantities during the Product Life Cycle at various Selling Prices are:

Selling Price per unit (₹)	400	480	600
Sale Quantity in units	5,000	4,000	2,500

Ignoring time value of money, compute the Net incomes generated over the Product Life Cycle at various prices. Which Price should the Company select?

STATEMENT SHOWING BEST-PRICE ANALYSIS

OPTION	I	II	III
QTY sold (units)	5000	4000	2500
S.P	400	480	600
(A) SALES	= 2000000 (5000 × 400)	= 1920000 (4000 × 480)	= 1500000 (2500 × 600)
(B) RELEVANT COST			
(1) RES & DEV COST	(240,000)	(240,000)	(240,000)
(2) DESIGN COST	(160,000)	(160,000)	(160,000)
(3) PRODUCTION COST (ONE TIME)	(100,000)	(100,000)	(100,000)
(4) PRODUCTION COST VARIABLE	(125,000) (5000 × 25)	(100,000) (4000 × 25)	(62,500) (2500 × 25)
(5) MARKETING COST (ONE TIME)	(70,000) (120,000)	(70,000) (96,000)	(70,000) (60,000)
VARIABLE	(5000 × 24)	(4000 × 24)	(2500 × 24)
(6) DIST-CST (ONE TIME)	(50,000) (80,000)	(50,000) (40,000)	(50,000) (40,000)
VARIABLE	(5000 × 16)	(4000 × 16)	(2500 × 16)
(7) CUSTOMER SERV. (ONE TIME)	(60,000) (150,000)	(80,000) (20,000)	(80,000) (75,000)
VARIABLE	(5000 × 30)	(4000 × 30)	(2500 × 30)

CHART 5 - COST MNGMT FOR SPECIFIC SECTOR

↓ ↓ ↓ ↓ ↓
Transportation Hospital Post/Telecom IT Toll Plaza

Steps for solving the sum :

- (1) Statement showing objective function .
- (2) Statement showing normal operating cost or income .
- (3) Final decision .

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Given :

	X-Oil Comp	Y-Oil Comp
Distance	24 kms	16 kms.
Capacity	8 tons	8 tons
Onwards	Full	Full
Return	empty	empty
Filling time	40 mins	30 mins
empty time	40 mins	40 mins
Speed	24 km/hr	24 km/hr
V-Cost	0.80 per km	0.80 per km
F-Cost	7.50 per hr	7.50 per hr

(1) Statement showing total kms / total ton kms & total time required .

	X - Oil Co	Y - Oil Co .
Distance	= 48 (24+24)	= 32 (16+16)
Tonne kms .	= 192 (24x8)+(24x0)	= 128 (16x8)+(16x0)
Total time reqd		
filling	40 mins	30 mins
empty	40 mins	40 mins
Running time .	= 120 mins $\left(\frac{60 \text{ min}}{24 \text{ km}} \times 48 \right)$	= 80 mins $\left(\frac{60 \text{ min}}{24 \text{ km}} \times 32 \right)$

(2) Statement showing normal op cost for income per ton km

X - Oil Co	Y - Oil Co
V-Cost	$= 38.40$
	(48×0.80)

F-Cost	$= 25$	$= 18.75$
	(200×7.50)	(150×7.50)
	60 min	60 min

Total	63.40	44.35
\div Tonne kms	$\div 192$	$\div 128$
$=$ Cost per tonne km.	$= 0.33$	$= 0.34$

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(1) Statement showing no of patient days / Rent.

Rent per patient per bed (General) = x .

$$\text{Gen} = 100 \times 360 \times 100\% = 36000$$

$$\text{extra bed} = (12000 \div 20) = 600$$

$$\text{Cottage} = 50 \times 80 \times 360 = 36000x$$

$$\bullet \text{ Cottage} = 50 \times 80 \times 360 = 14400 \times 2.50x = 36000x$$

$$\bullet \text{ Deluxe} = 30 \times 60\% \times 360 = 6480 \times 5x = 32400x$$

$$(36000 + 36000 + 32400)x = 105000x$$

(2) statement showing total ^{Takings} ~~charges~~ for the year.

$$\text{Rent } (10000 \times 12) = 120000$$

$$\text{Hire Charges} = 12000$$

$$\text{Dr - Fees } (15000 \times 3) = 45000$$

$$\text{Supervisor Sal} = 425000$$

$$\text{Repair & Maint} = 90000$$

$$\text{Dr - Sal} = 1350000$$

$$\text{Food Supply} = 40000$$

$$\text{Laundry charges} = 80500$$

$$\text{Medicine Supply} = 74000$$

$$\text{Cost of O}_2 = 49500$$

$$\text{Gen admin} = 63000$$

$$\underline{2349000}$$

$$+ \text{ Rent @ } 5\% = 156600$$

$$+ \text{ Profit @ } 20\% = 626400$$

Total

~~2349000~~ 3132000

~~(2349000 \times 10\%)~~

$$\begin{aligned}x &= (3132000 \div 105000) \\&= \underline{\underline{29.83}}\end{aligned}$$

Statement showing final answer

General	Cottage (29.83×2.5)	Deluxe (29.83×5)
29.83	$= 74.57$	$= 149.14$
GST @ 8%	2.38	5.97
BILL Amt	<u>32.21</u>	<u>80.53</u>
		161.07

COST OF MANAGEMENT FOR SPECIFIC

CASE STUDY No.... 21.

Page No.

1

INFORMATION TO

BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls from passing vehicles using the same. The company has invested ₹600 crore to build the road and has estimated that a total of 60 crore vehicles will be using the highway during the 10 years toll collection tenure. Toll Operating and Maintenance cost for the month of April 20X7 are as follows:

(i) Salary to -

- o Collection Personnel (3 Shifts and 4 persons per shift) - ₹150 per day per person
- o Supervisor (2 Shifts and 1 person per shift) - ₹ 250 per day per person
- o Security Personnel (3 Shifts and 2 persons per shift) - ₹150 per day per person
- o Toll Booth Manager (2 Shifts and 1 person per shift) - ₹400 per day per person

(ii) Electricity - ₹ 80,000

(iii) Telephone - ₹ 40,000

(iv) Maintenance cost - ₹ 30 Lacs

(v) The company needs 25% profit over total cost to cover interest and other costs.

Required:

(i) Calculate cost per kilometer.

(ii) Calculate the toll rate per vehicle (assume there is only one type of vehicle).

BB

COSTING OF TOLL ROADS

42 59

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SECOND(1) B.H.G. TOLL-PLAZA LTD

GIVEN \rightarrow TOTAL KMS = 60

(ASSUME - ONLY ONE TYPE VEHICLE) B.

(A)	APPORTIONMENT OF CAPITAL COST	$(\frac{6000}{10} \times \frac{1}{12})$	500,00,000
(B)	OPERATING COST		
(i)	SACARY OF COLLECTION PERSONNEL.		54000
	(3SHIFTS X 4PERSON X 150perday X 30days)		
(ii)	SUPERVISOR SACARY (2SHIFTS X 1PERSON X 250 X 30days)		15000
(iii)	SACARY OF SECURITY PERSONNEL. (3SHIFTS X 2PERSON X 150)X 30days.		27000
(iv)	TOLL BOOTH MANAGER. (2SHIFTS X 1PERSON X 400X 30days)		24000
(v)	ELECTRICITY		80000
(vi)	TELEPHONE		40000
(vii)	M AINT-COST		3000000
			<u>5324000</u>



Step No (2)

STATEMENT SHOWING CALCULATION
OF COST PER KM

$$= \frac{(\text{TOTAL COST})}{(\text{TOTAL KMS})}$$

$$= \frac{(532,40,000)}{60 \text{ kms}} = 887333.333$$

Step No (3)

STATEMENT SHOWING TOLL RATE PER
VEHICLE

$$\text{TOTAL COST} \quad 532,40,000$$

$$\text{PROFIT } 25\% \quad 133,10,000$$

$$\frac{532,40,000}{66,55,00,00}$$

$$\frac{(66,55,00,00)}{* 5000,000} = 13.31$$

* NO OF VEHICLES USING HIGHWAY
PER MONTH

$$\frac{\text{TOTAL ESTIMATED}}{\text{VEHICLES}} \times \frac{1 \text{ month}}{12 \text{ months}}$$

$$\frac{6000}{10 \text{ years}} \times \frac{1 \text{ month}}{12 \text{ months}} = 500,000$$

500,000

COSTING FOR FINANCIAL INSTITUTIONS

F12-24

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EX G1

(+) CASE STUDY NO. 12

STATEMENT SHOWING COST-SHEET

(1) DIRECT LABOUR COST 80000

(2) OVER HEAD COST (25% X 12000) 30000

83000

COST-PER APPLICATION = 83000 / 100 = 830

CASE STUDY NO. 12

ILLUSTRATION

The loan department of a bank performs several functions in addition to home loan application processing task. It is estimated that 25% of the overhead costs of loan department are applicable to the processing of home-loan application. The following information is given concerning the processing of a loan application:

Direct professional labor:

	(₹)
Loan processor monthly salary: (4 employees @ ₹ 20,000 each)	80,000
Loan department overhead costs (monthly)	
Chief loan officer's salary	5,000
Telephone expenses	750
Depreciation Building	2,800
Legal advice	2,400
Advertising	400
Miscellaneous	650
Total overhead costs	<u>12,000</u>

You are required to compute the cost of processing home loan application on the assumption that one hundred home loan applications are processed each month.

ILLUSTRATION 9

Following are the data pertaining to Infotech Pvt. Ltd. for the year 20X6-X7

	Amount (₹)
Salary to Software Engineers (5 persons)	15,00,000
Salary to Project Leaders (2 persons)	9,00,000
Salary to Project Manager	6,00,000
Repairs & maintenance	3,00,000
Administration overheads	12,00,000

The company executes a Project XYZ, the details of the same are as follows:

Project duration - 6 months

One Project Leader and three Software Engineers were involved for the entire duration of the project, whereas Project Manager spends 2 months' efforts, during the execution of the project.

Travel expenses incurred for the project - ₹1,87,500

Two Laptops were purchased at a cost of ₹ 50,000 each, for use in the project and the life of the same is estimated to be 2 years

Prepare Project cost sheet

57

COSTING OF IT - ITES

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6.3

46

(ILY)-9/

COSTING FOR I.T & ITES

INFOTECH - PVT - LTD

STATEMENT SHOWING PROJECT COST - SHEET

20X6 - 20X7

RS

DURATION OF PROJECT - 6 MONTHS

(1) SALARY OF SOFTWARE ENGINEER 450000
 $(3 \times 25000 \times 6 \text{ months})$

(2) SALARY OF PROJECT LEADER 225000
 (37500×6)

(3) SALARY OF PROJECT MANAGER 100000
 (50000×2)

TOTAL SALARY 775000

OVERHEADS $(50\% \times 775000)$ = 387500

RECT RATE = $\frac{\text{OVERHEADS}}{\text{SALARY}} = \frac{1500000}{3000000} \times 100$

TRAVEL EXP = 50% 187500

DEP ON LAPTOP $(100000 \times \frac{1}{2 \text{ years}} \times 0.5 \text{ years})$ 25000
 (50000×2)

TOTAL PROJECT COST 1375000

* SALARY OF SOFTWARE ENGINEER / PER MONTH
 PFL - ENGINEER

$(1500000 \div 5) = 25000$
 $\frac{1}{2}$

SALARY OF PROJECT LEADER / PER MONTH / PFL P.L.
 $(50000 \div 2) = 37500$

SALARY OF PROJECT MAN = 56000

Chp. Application of Linear Programming in
Decision Making

Formulation

Solution

Graphical

Simplex
(not in syllabus)

Meaning of Formulation: If we put all the given information into equation form it is known as formulation.

Steps for solving the sum:

Step 1) Tabular Form

Step 2) Formulation

etc

Sir's Example:

Step 1)

			Products		
	$A = x_1$	$B = x_2$			
M_1	2 hrs	4 hrs			<u>Max Capacity</u>
M_2	4 hrs	2 hrs			24 hrs
<u>Basic Variables</u>					24 hrs
<u>Max profit</u>	₹ 4	₹ 2			<u>Resource</u>
			<u>Objective function</u>		

$$\text{Max}(Z) = 4x_1 + 2x_2$$

$$2x_1 + 4x_2 \leq 24$$

$$4x_1 + 2x_2 \leq 24$$

$$x_1, x_2 \geq 0$$

Since basic variables can never be negative

Case Study 8.9

Step 1: Tabulation

	<u>A = x₁</u>	<u>B = x₂</u>	Max hrs
M ₁	2 hrs	6 hrs	24 hrs
M ₂	6 hrs	2 hrs	24 hrs
Max R.	∞	∞	

Step 2: Formulation

$$\text{Max}(Z) = 5x_1 + 2x_2$$

$$2x_1 + 6x_2 \leq 24$$

$$6x_1 + 2x_2 \leq 24$$

$$x_1, x_2 \geq 0$$

GRAPH IS GIVEN AT
LAST

$$\underline{2x_1 + 6x_2 = 24}$$

$$\text{if } x_1 = 0 \quad x_2 = 4$$

$$\text{if } x_2 = 0 \quad x_1 = 12$$

$$\underline{6x_1 + 2x_2 = 24}$$

$$\text{if } x_1 = 0 \quad x_2 = 12$$

$$\text{if } x_2 = 0 \quad x_1 = 4$$

Now here

Statement showing Maximum Profit

4 hrs

$$x_1 + x_2 = \text{Maximum Profit}$$

4 hrs (a) $0 \times 5 + 0 \times 2 = 0$

4 hrs (b) $4 \times 5 + 0 \times 2 = 20$

(c) $3 \times 5 + 3 \times 2 = 21$

(d) $0 \times 5 + 4 \times 2 = 8$

∴ Point C

After naturally, if not time as per
new syllabus if they have ~~not~~ not
said solve graphically; we can
do simultaneous equation

$$2x_1 + 6x_2 = 24 \times 3$$

$$\text{i.e. } 6x_1 + 18x_2 = 72$$

$$\underline{6x_1 + 2x_2 = 24}$$

$$\text{i.e. } x_2 = 48$$

$$\therefore x_2 = 3 \quad \cancel{x_2 = 3}$$

By Substitution

$$x_1 = 3$$

Case Study 70

	Tables = x_1	Chairs = x_2	
Assembly	4	2	60 hrs
Finishing	2	4	48 hrs
Net Profit	₹ 80	₹ 60	

$$\text{Max}(Z) = 80x_1 + 60x_2$$

$$4x_1 + 2x_2 \leq 60$$

$$2x_1 + 4x_2 \leq 48$$

$$x_1, x_2 \geq 0$$

~~$$\therefore 4x_1 + 2x_2 \leq 60$$~~

$$\text{If } x_1 = 0 \quad x_2 = 30$$

$$x_2 = 0 \quad x_1 = 15$$

~~$$2x_1 + 4x_2 \leq 48$$~~

$$\text{If } x_1 = 0 \quad x_2 = 12$$

$$x_2 = 0 \quad x_1 = 24$$

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Statement Showing Maximum Profit

$$x_1 + x_2 = \text{Maximum Profit}$$

(a) $80 > 0 \quad 60 \times 0 = 0$

(b) $80 \times 15 \quad 60 \times 0 = 1200$

(c) $\checkmark \quad 80 \times 12 \quad 60 \times 6 = 1,320$

(d) $80 \times 0 \quad 60 \times 12 = 720$

60 hrs

48 hrs

\therefore Maximum profit of 1320 at $x_1=12$, $x_2=6$

Alternatively, sum of two equations:

$$4x_1 + 2x_2 \leq 60$$

$$2x_1 + 4x_2 \leq 48$$

~~$$\therefore 4x_1 + 2x_2 \leq 60$$~~

~~$$4x_1 + 8x_2 \leq 96$$~~

~~$$* 6x_2 = 36$$~~

$$x_2 = 6$$

by Substituting $x_1 = 12$

\therefore Maximum Profit at $x_1=12$, $x_2=6$

	$\text{Fan} = x_1$	$\text{Sewing Machine} = x_2$
Cost	360	240
Space		20
Max P.	22	18

(Ans 1)

Given

we can solve

$$\text{Max}(Z) = 22x_1 + 18x_2$$

$$x_1, x_2 \geq 0$$

$$360x_1 + 240x_2 \leq 5760$$

$$x_1 + x_2 \leq 20$$

~~Max~~

$$360x_1 + 240x_2 \leq 5760$$

$$\text{If } x_1 = 0, x_2 = 24$$

$$x_2 = 0, x_1 = 16$$

$$\text{If } x_1 + x_2 \leq 20$$

$$\text{If } x_1 = 0, x_2 = 20$$

$$\text{If } x_2 = 0, x_1 = 20$$

Statement showing Maximum Profit

$$x_1 + x_2$$

(a) $0 \times 22 + 0 \times 18 = 0$

(b) $16 \times 22 + 0 \times 18 = 352$

(c) $8 \times 22 + 12 \times 18 = \text{392}$

(d) $0 \times 22 + 20 \times 18 = 360$

\therefore Maximum profit at $x_1 = 8, x_2 = \frac{12}{2} = 6$
of £. $\therefore 392$

Alternatively, solving simultaneously

$$360x_1 + 240x_2 \leq 5760$$

~~$$360x_1 + 360x_2 \leq 20 \times 360$$~~

~~$$360x_1 + 240x_2 \leq 5760$$~~

~~$$360x_1 + 360x_2 \leq 7200$$~~

$$120x_2 = 1440$$

$$x_2 = 12$$

Substituting $x_1 = 8$

Case Study 95

Products :

$$A = x_1$$

$$B = x_2$$

P	2 hrs	4 hrs	1400
---	-------	-------	------

Q	5 hrs	4 hrs	2000
---	-------	-------	------

S.P. p.u.	300	200	
(\rightarrow) V.C. of Mfg	(160)	(60)	
(\rightarrow) Sales comn	(60)	(40)	
Constr. p.u.	80	100	$\frac{F.C.}{= 34000}$ $14000 + 24000$

Max. Sale	8400	400
-----------	------	-----

$$2x_1 + 4x_2 = 1400$$

$$5x_1 + 4x_2 = 2000$$

$$Max(\text{Profit}) = 80x_1 + 100x_2 - 34000$$

$$x_1 \leq 400$$

$$x_2 \leq 400$$

$$x_1, x_2 \geq 0$$

Statement showing Maximum Profit

$$2x_1 + 4x_2 = 1400$$

$$\text{If } x_1 = 0, x_2 = 350$$

$$\begin{array}{l} 1400 \\ \text{Ans} \\ 1400 \end{array}$$

$$\text{If } x_2 = 0, x_1 = 300$$

$$5x_1 + 4x_2 = 2000$$

$$\text{If } x_1 = 0, x_2 = 500$$

$$\text{If } x_2 = 0, x_1 = 400$$

$$\underline{x_1 = 400}$$

$$\underline{x_2 = 400}$$

Statement showing Maximum Profit

$$x_1 + x_2 - \frac{\text{Fixed Cost}}{\text{Profit}} = \text{Profit}$$

$$(a) 0 \times 80 + 0 \times 100 - \frac{34000}{\text{Profit}} = (34000)$$

$$(b) 400 \times 80 + 0 \times 100 - \frac{34000}{\text{Profit}} = (2000)$$

$$\checkmark (c) 200 \times 80 + 250 \times 100 - \frac{34000}{\text{Profit}} = 7000$$

$$4000 \quad (d) 0 \times 80 + 350 \times 100 - \frac{34000}{\text{Profit}} = 1000$$

Alternatively, Simultaneous equation

$$2x_1 + 4x_2 = 1400$$

$$5x_1 + 4x_2 = 2000$$

$$- \quad - \quad -$$

$$- 3x_1 = 600$$

$$x_1 = 200$$

by Substituting $x_2 = 250$.

\therefore Max Profit of 7000 at $x_1 = 200, x_2 = 250$

Case Study 9.3

$$A = x_1, \quad B = x_2$$

P 16 20 160

Q 10 25 150

R 4 0 32

240 140 FC = 1200

$$\text{Max}(Z) = 240x_1 + 140x_2 - 1200$$

$$16x_1 + 20x_2 \leq 160$$

$$10x_1 + 25x_2 \leq 150$$

$$4x_1 \leq 32$$

~~$$16x_1 + 20x_2 \leq 160$$~~

~~$$\text{If } x_1 = 0, \quad x_2 = 8$$~~

~~$$\text{If } x_2 = 0, \quad x_1 = 10$$~~

~~$$10x_1 + 25x_2 \leq 150$$~~

~~$$\text{If } x_1 = 0, \quad x_2 = 6$$~~

~~$$\text{If } x_2 = 0, \quad x_1 = 15$$~~

$$4x_1 \leq 32$$

$$x_2 = 0, \quad x_1 = 8$$

$$x_1 = 0, \quad x_2 = 0$$

Statement showing ~~Sales~~ ~~Profit~~ Max Profit

	X_1	$+ X_2$	= Total Contr. - F.C = Profit
(a)	0 \times 240 + 0 \times 140	= 0	1200 = (1200)
(b)	8 \times 240 + 0 \times 140	= 1920	1200 = 720
✓ (c)	8 \times 240 + 1.5 \times 140	= 2144 ²¹⁴⁴	1200 = 944 ⁹⁴⁴
(d)	5 \times 240 + 4 \times 140	= 1760	1200 = 560
(e)	0 \times 240 + 6 \times 140	= 840	1200 = (360)

Alternatively, Solving simultaneously

∴ Maximum profit at $X_1 = 8$

: of ₹ ~~230944~~ $X_2 = 1.5$

Case Study 91

	$x_1 = x_1$	$y = x_2$	Min Requirement
A	36	6	108
B	3	12	36
C	20	10	100
Cost	20	40	

$$\text{Min.}(Z) = 20x_1 + 40x_2$$

$$36x_1 + 6x_2 \geq 108$$

$$3x_1 + 12x_2 \geq 36$$

$$20x_1 + 10x_2 \geq 100$$

$$x_1, x_2 \geq 0$$

~~for the X₁~~

$$\underline{36x_1 + 6x_2 \geq 108}$$

$$\text{If } x_1 = 0, x_2 = 18$$

$$x_2 = 0, x_1 = 3$$

$$\underline{3x_1 + 12x_2 \geq 36}$$

$$\text{If } x_1 = 0, x_2 = 3$$

$$x_2 = 0, x_1 = 12$$

$$\underline{20x_1 + 10x_2 \geq 100}$$

$$\text{If } x_1 = 0, x_2 = 10$$

$$x_2 = 0, x_1 = 5$$

Statement showing Analysis of Min cost

	x_1	$+ x_2$	Cost
(a)	0×20	18×40	$= 720$
(b)	2×20	6×40	$= 640$
(c)	4×20	2×40	$= 160 \checkmark$
(d)	12×20	0×40	$= 240$

\therefore Min Cost = ₹ 160 at $x_1 = 4$
 $x_2 = 2$

Alternatively, ~~simplifying~~ equation:

~~$3x_1 + 6x_2 = 108 \times 2$~~

~~$3x_1 + 12x_2 = 36$~~

~~$72x_1 + 12x_2 = 216$~~

~~$3x_1 + 12x_2 = 36$~~

~~$69x_1 = 120$~~

~~$x_1 = 2$~~

Practice Set

Application of Simplex in LPP

Case Study 94

Step No. 1:

	<u>$D_1 = x$</u>	<u>$D_2 = x$</u>	<u>Maximize</u>
R ₁	2	5	16
R ₂	6	0	30
P.L.	2	10	

Net Evaluation Row

$$\text{Max}(Z) = 2x_1 + 10x_2$$

subject to

$$2x_1 + 5x_2 \leq 16$$

$$6x_1 \leq 30$$

~~$2x_1 + 10x_2 \leq 30$~~

$$x_1, x_2 \geq 0$$

Introducing the slack variable so
the equation can be
written as

$$\text{Max}(Z) = 2x_1 + 10x_2 + 0S_1 + 0S_2$$

$$2x_1 + 5x_2 + S_1 = 16$$

$$6x_1 + 0x_2 + S_2 = 30$$

X1
X2
S1
S2
RHS

Row 1
Row 2
Inconverge

Row 1 with S_1, S_2

Simplex Table

Fixed Ratio	Profit Products	Qty	(C_j)	$\frac{z}{x_1}$	$\frac{10}{x_2}$	$P.S.$	S_2^0	Replace Ratio
-	0	S_1	16	2	$\frac{10}{x_2}$	S_1	0	$\frac{16}{2} = 8$
0 = 0	20	S_2	30	6	0	0	1	$\frac{30}{2} = 15$
S_1				$\frac{z}{x_1} = 2$	0	0	0	
					$\frac{10}{x_2} = 2$	$\frac{10}{x_2} + \frac{10}{x_2}$	$\frac{10}{x_2} + \frac{10}{x_2}$	$\frac{10}{x_2} + \frac{10}{x_2}$

$$NER (C_j - z_j) = 2 - 10 = 0$$

Net Evaluation Row

Positive i.e. 10 is the maximum profit

$$\begin{array}{ccccccc} & 10 & x_2 & 0 & \frac{10}{x_1} & \frac{1}{x_2} & \frac{1}{x_2} & 0 \\ & 0 & S_2 & 0 & & & & \end{array}$$

$$\begin{array}{ccccc} c_j & 2 & 0 & 2 & \\ c_j & 4 & 10 & 2 & 0 \end{array}$$

$$(10 \times 2) - (10 \times 1) = 10$$

$$NER (C_j - z_j) = -2 - 0 = -2$$

So

xe

$$z + 0S_1 + 0S_2$$

30

WN

Other than Key factors = $\frac{\text{Fixed Ratio}}{\text{Key factor Row}} \times \text{Key factor Row}$

$$30 = (0 \times 16) = 30$$

$$6 = (0 \times 2) = 6$$

$$0 = (0 \times 5) = 0$$

$$0 = (0 \times 1) = 0$$

$$1 = (0 \times 0) = 1$$

Find the

fact

	<u>Product</u>	<u>Qty</u>	<u>Rate</u>	<u>Max Pt</u>
30	x_2	$\frac{16}{5}$	$\times \frac{10}{1}$	= 32
6				
0				
0				
1				

First introduce slack variable

First write table of simplex

Date

SATURDAY

21-7

CASE-STUDY-STANDARD
COSTING

SATURDAY

28-7

"

SATURDAY

4-7

CASE-STUDY-STRATEGIC
ANALYSIS OF OPERATING
INCOME

CASE-STUDY DECISION-MAKING PART(A)(i)

~~DEFENSE~~~~HOLD~~C.V.P / ~~SHED~~ SHUTDOWN

CASE STUDY

SATURDAY

11-8

DECISION MAKING PART(B)

COST CONCEPT - (RELEVANT COSTING)

CASE STUDY

DECISION MAKING PART(B)

LIMITING FACTOR

25-8

INTRODUCTION TO STRATEGIC
COST-MANAGEMENT

COST-MANAGEMENT TECHNIQUES

(i) TARGET COST

(ii) COST CONTROL COST REDUCTION

LEAN SYSTEM & INNOVATION

(i) JUST IN TIME

MODERN BUSINESS ENVIRONMENT

TOTAL QUALITY MANAGEMENT
(TQM)

1-9- 18

(12 TO 6 PM)

CHAPTER 7 & 8

PRICING DECISIONS 8

DIVISIONAL TRANSFER PRICE

2-9-18

(4 TO 6.40)

APPLICATION OF LEARNING

CURVE IN DECISION MAKING

8-9-18

PRICING DECISION TRANSFER PRICE
(स्ट्रिपल)

PARETO ANALYSIS (स्ट्रिपल)

CHAPTER 11 & 8

BUDGETING CONTROL &
PERFORMANCE EVALUATION

स्ट्रिपल

BALANCE SCORE CARD (स्ट्रिपल)

THROUGH ACCOUNTING (स्ट्रिपल)

KATZEN COSTING (स्ट्रिपल)

LIFE CYCLE COSTING (स्ट्रिपल)

COST FOR SPECIFIC SELLER (स्ट्रिपल)

15-9-18

L.P.P - (DECISION MAKING)

15-9-18

SATURDAY

8 TO 12

NEW
TOPIC

L.P.P. - APPLICATION - IN - DECISION MAKING

NEW & OLD SYLLABUS

NEW STUDENT CAN JOIN - ONE DAY TOPIC

15-9-18

SATURDAY

12 TO 6

L.M.R. - ITS-A-CRASH-COURSE)

16-9-18

SUNDAY

8 TO 12

STANDARD COSTING - CONTINUE :-----.

16-9-18

SUNDAY

12 TO 1

SIMULATION ----- CONTINUE -----

NEW
TOPIC

16-9-18

SUNDAY

1 TO -----

TRANSPORTATION- O.R- ONLY - FOR - OLD SYLLABUS
(ONE - DAY - TOPIC - NEW - STUDENTS CAN JOIN)NEW
TOPIC

22-9-18

SATURDAY

8 TO 10

DECISION MAKING - PART (A) (i)

C.V.P. ANALYSIS - B.E.P. ANALYSIS

(NEW - STUDENTS CAN JOIN)

ITS FOR NEW & OLD SYLLABUS)

NEW
TOPIC

22-9-18

SATURDAY

10.30 TO 12

TARGET COSTING / COST-CONTROL

(NEW TOPIC - NEW - STUDENTS CAN JOIN)

ITS FOR OLD & NEW SYLLABUS)

22-9-18

SATURDAY

12 TO 6

L.M.R. - ITS - A - CRASH COURSE

23-9-18

SUNDAY

8 TO 12

STANDARD COSTING CONTINUE -----.