MARGINAL AND ABSORPTION COSTING

Marginal/ direct/ variable costing

- It is a technique of presenting costing information whereby, only variable manufacturing costs are considered as the only manufacturing costs. The fixed costs are therefore treated as the periodic cost and they are written in the income statement in the period in which they were incurred. This does not comply with the accounting rules i.e. the international accounting standards and the international financial reporting standards.
- Marginal costing is used to prepare the reports that are to be used internally. In the marginal costing, the opening and closing stock is valued on the basis of the variable manufacturing costs only.

ABSORPTION/INDIRECT /TOTAL/FULL COSTING

It is a technique of presenting financial information whereby the manufacturing costs is a combination of both variable and fixed costs. Absorption costing information is used by external parties e.g. the creditors. In absorption costing opening and closing stock is valued on the basis of the total production cost i.e. fixed + variable production cost.

- **DIFFERENCE BETWEEN MARGINAL & ABSORPTION COSTING**

Absorption Costing	Marginal Costing
1. The report is used by external parties.	1. The report is used by internal parties i.e. the management.
2. It's a method used in applying overheads at the pre-determined rates into production.	2. It's a technique concerned with the effect of the overheads on running the business.
3. Costs are classified as production/ administrative/ distribution.	3. Costs are classified as fixed or variable costs.
4. It takes into account both fixed and variable production cost in valuation of stocks	4. It only includes the variable production cost in valuation of stocks
5. It complies with international accounting standards (IAS) and international financial reporting standards (IFRS) when preparing the report.	5. It doesn't comply with IAs or IFRS when preparing the report
6. It is recommended by the accounting standards.	6. It is not recommended by the standards in the report.
7. Overheads are recovered using the pre-determined rates and therefore it leads into over & under absorption	7. Over/ under absorption doesn't arise as the fixed overheads is used as a periodic cost.

Similarities between marginal and Absorption Costing

1. They are both used to determine the profitability of the company.

2. Both reports are used for decision-making.

CPA DEC 2005 Q3

The company has been reporting its profits using absorption-costing system. During the financial year ended 30 September 2005, the following summary statement was provided.

Sales (4000 units)		5000,0000
Production cost of sales:		
Variable	3000,000	
Fixed	1000,000	(4000,000)
Gross profit		1000,000
Expenses:		
Variable	800,000	
Fixed	800,000	(1600000)
Net loss		(600,000)

Currently the company is implementing strategies to improve its profitability, which are to be implemented in two phases; A and B. Each phase will cover a period of six months.

The expected production and sales in units for each of the phases are shown below:

	Phase A units	Phase B Units
Production	2,500	3000
Sales	2,400	2,900

The fixed costs are expected to increase by 20% while the variable costs per unit will remain as they were in the previous period. The selling price per unit will be sh. 1,500.

Required:

(a) Profit and loss statement for phases A and B using:
  (i) Marginal costing.
  (ii) Absorption costing
(b) Briefly explain the differences resulting from the two methods employed in (a) above of reporting profits.

(c) Reconcile the resulting difference in the reported profit under the two methods.

(d) Briefly explain which of the two methods is better in estimating profits of manufacturing enterprises

Solution:

Variable production cost per unit	3000000/4000	=750
Fixed production cost per unit	1000,000/4000	= 250+(20% X 250) = 300
Variable expenses per unit	800,000/4000	=200
Fixed expenses per unit	800000/4000	=200 + (20% x 200) =240

PHASE A

INCOME STATEMENT USING MARGINAL COSTING

Sales: 2400 x 1500		3,600,000
Less: Marginal cost of sales:		
Opening stock (0 x 750)	-	
Add: variable production cost: 2500 x 750	1875000	
Less: Closing stock : 100 x 750	(75000)	(1800,000)
Gross marginal profit		1800000
Less: variable expenses : 2400 x 200		(480,0000
Net marginal profit		1,320,000
Less : fixed costs		
Fixed production costs: 2500x 300	750,000	
Fixed expenses 2400 x 240	57600	(1326000)
Net loss		(6000)

INCOME STATEMENT USING ABSORPTION COSTING

Sales: 2400 x 1500		3600000
Less: Cost of Sales		
Opening Stock: 0 x 1050	-	
Production cost: 2500 x1050	2625000	
Less: Closing stock: 100 x 1050	(105000)	2520000
Gross profit		1080000
Less expenses:		
Fixed expenses : 2400 x 240	576000	
Variable cost: 2400 x 200	480000	(1056000)
Net profit		24000

Reconciliation Statement

Net profit as per Marginal statement	(6000)
Adjustment in Stock:	

	Marginal	-	Absorption	
Opening stock	-		-	
Less closing stock	75000		105000	
	-75000	-	-105000	30000
Net profit as per Absorption costing				24000

(b) The reasons for the difference in the profits in the two methods is in the valuation of opening and closing stock. Under marginal costing the value of the opening and closing stock takes into account only variable production cost while under Absorption costing the value of the closing stock and opening stock take into account variable and fixed production costs.

PHASE B

INCOME STATEMENT USING MARGINAL COSTING

Sales: 3000x 1500		4500000
Less: **Marginal cost of sales**:		
Opening stock (0 x 750)	-	
Add: variable production cost: 3000x 750	2250000	
Less: Closing stock : 100 x 750	(75000)	(2175000)
Gross marginal profit		2325000
Less: variable expenses : 2900 x 200		(580,000)
Net marginal profit		1745000
Less : fixed costs		
Fixed production costs: 3000x 300	900,000	
Fixed expenses 2900 x 240	696000	(1596000)
Net profit		149000

INCOME STATEMENT USING ABSORPTION COSTING

Sales: 3000 x 1500		4500000
Less: Cost of Sales		
Opening Stock: 0 x 1050	-	
Production cost: 3000x1050	3150000	
Less: Closing stock: 100 x 1050	(105000)	3045000
Gross profit		1455000
Less expenses:		
Fixed expenses : 2900 x 240	696000	
Variable cost: 2900 x 200	580000	(1276000)
Net profit		179000

Reconciliation Statement

Net profit as per Marginal statement	149000

Adjustment in Stock			
	Marginal -	Absorption	
Opening stock	-	-	
Less closing stock	75000	105000	
	-75000 -	-105000	30000
Net Profit as per Absorption costing			179000

CPA MAY 2015 Q 3b

INCOME STATEMENT USING MARGINAL COSTING

		"000"
Sales: 1000 x 10,000		10000
Less: Marginal cost of sales:		
Opening stock	-	
Add: production cost: 500x12000	6000	
Less: Closing stock : 500x2000	(1000)	(5000)
Gross marginal profit		5000
Less: variable expenses : 10%x10,000		(1000)
Net marginal profit		4000
Less : fixed costs		
production costs:	1980	
Selling expenses	300	
Administration	500	(2780)
Net profit		1220

INCOME STATEMENT USING ABSORPTION COSTING

Sales:		10000
Less: Cost of Sales		
Opening Stock:	-	
Production cost: 12000x680	8160	
Less: Closing stock: 2000x680	(1360)	(6800)
Gross profit		3200
Over/under Absorption (12000-11000)x180		180
Less: Operating expenses		
Fixed selling expenses	1000	

Variable selling expenses	300	
Fixed administrative	500	(1800)
Net profit		1580

Reconciliation Statement

Net profit as per Marginal statement		1220
Adjustment in Stock		
	Marginal - Absorption	
Opening stock	- -	
Less closing stock	1000 1360	
Net Profit as per Absorption costing	-1000 - - 1360	360 1580

APPLICATION OF MARGINAL COSTING

1. **COST VOLUME PROFIT ANALYSIS (CVP)**

This is also known as break-even analysis. At breakeven point the $Total\ cost = Total\ revenue$ therefore there will be no profit/ loss.

It is a technique, which is used by the management to study the behaviour of the profit in response to the changes in volume, selling price and the total cost. It is used by the management to determine the optimal volume, cost and the selling price.

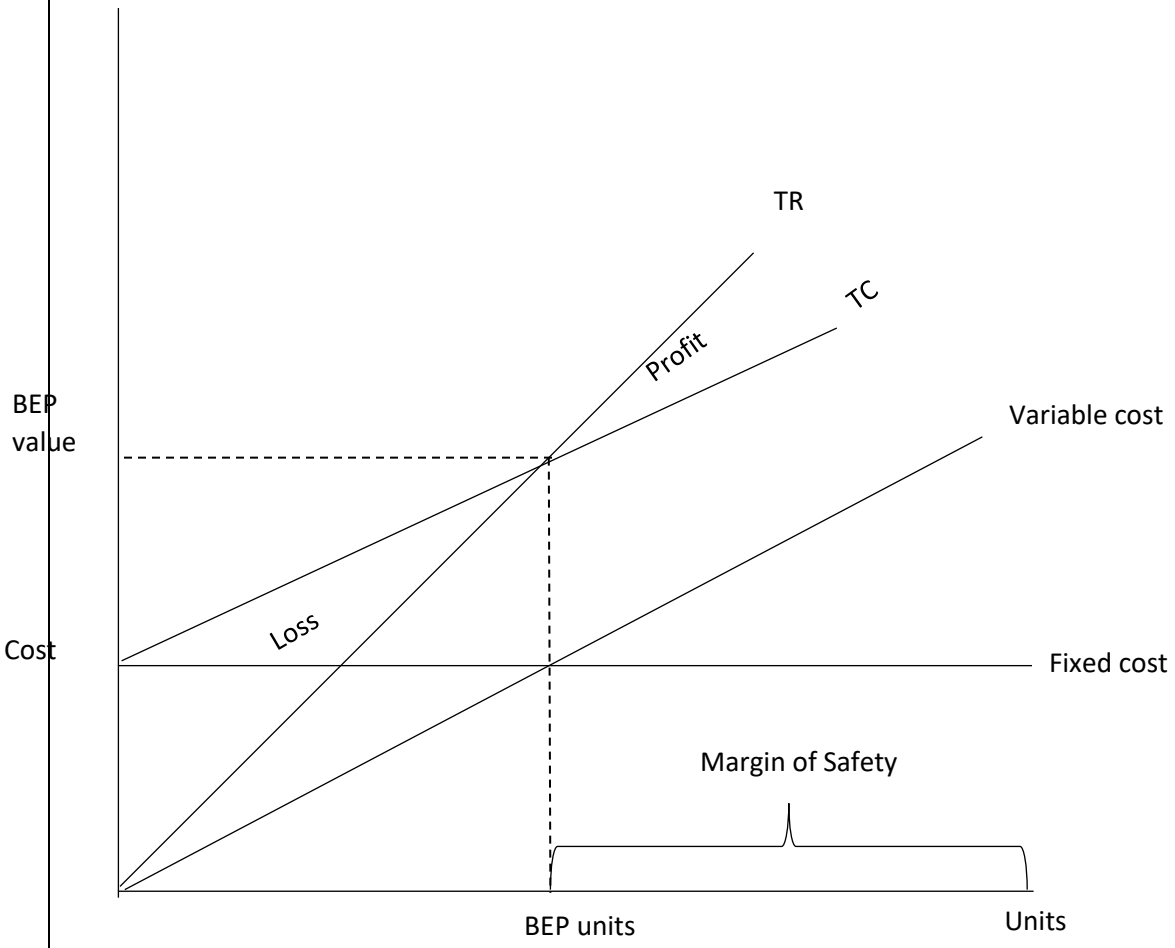
ASSUMPTIONS/ LIMITATION OF CVP ANALYSIS

2. All the cost are either fixed or variable i.e. semi- variable costs are not included
3. All the units produced are sold.
4. The volume is known in advance and is assumed to be the only factor affecting profit.
5. The selling price remains constant at all levels of sales.
6. All the functions encountered in CVP i.e. profit function, cost function e.t.c are linear.
7. All the parameters are known in advance and remain constant.
8. It assumes that organisation produce and sells one product

NB//= for the limitation of the CVP analysis entices the assumptions.

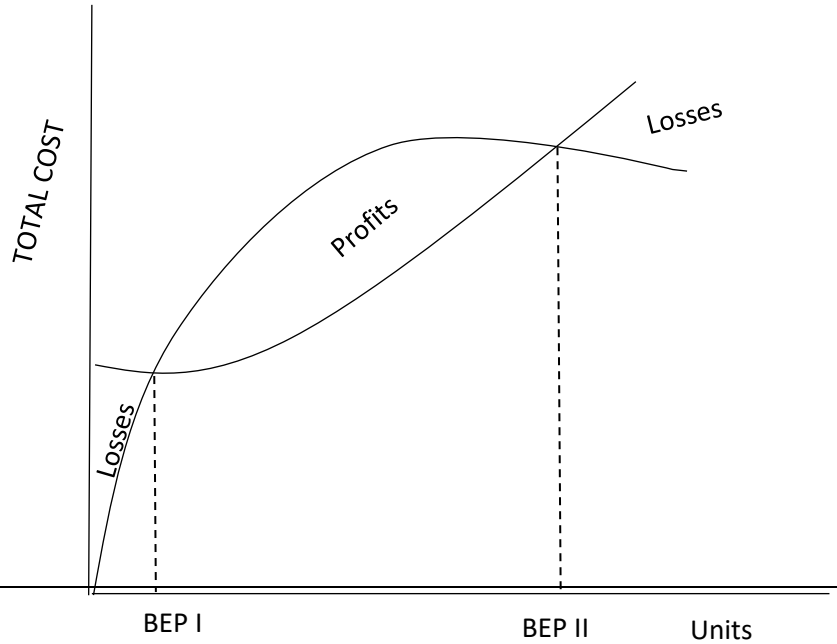
The CVP model is normally analysed graphically in two ways;
ACCOUNTANT MODEL

- Under this method, there will be only one breakeven point in the company i.e. when the TC=TR
- Its represented graphically as follows;



➢ Economic model

- Under this model there will be 2 break even points i.e. during the growth stage of the company and the decline stage of the company



Using the above models the CVP analysis would be analysed using

P – Selling price per units
V – Variable cost per units
X – Number of units manufactured and sold
F – Total fixed cost
π – Profits
R – Sales Revenue
XT – Target profit in units
RT – Target profits in shillings
Cm – Contribution margin (p –v)
CMR – contribution margin ratio/ contribution to sales ratio
$= \frac{p-v}{P}$
VCR (variable cost Ratio) = $\frac{v}{p}$
VCR+CMR=1
Using the above variables, the CVP models is represented as follows:

a) Sales in units (x)
   i) Profit (π) = $(p-v)x-f$
      = $cm \times x - f$
   ii) BEP in units = $\frac{F}{CM} = \frac{F}{p-v}$
   iii) Sales for the target profit in units (x)
      X= $\frac{F+T}{Cm}$
b) Sales in shilling/ value(S)
   i) Profit π = $cmr \times R - f$
      = $\frac{p-v}{p} \times R - f$
   ii) BEP in shillings = $\frac{f}{cmr}$
   iii) Sales in shillings for the target profit (s)

$$s = \frac{F+T}{Cmr}$$

iv) $CMR + VCR = 1$

v) Margin of safety = $actual\ or\ budgeted\ sales - BEP sales$

CPA - November 2010 Q4

i) BEP in units = $\frac{F}{CM}$

F= 600000

P = 200

V = 100

$$\frac{600000}{200-100} = \frac{600000}{100}$$

= 6000Tickets

BEP shillings = $\frac{F}{cmr}$

$$cmr = \frac{p-v}{P} = \frac{200-100}{100}$$
$$= 0.5$$
$$\frac{600000}{0.5} = \boldsymbol{KSH.1200000}$$

ii) XT = $\frac{f+T}{cm} in\ units$

$\frac{6000000+300000}{200-100} =$ **9000TICKET**

In shillings (RT)

$$= \frac{F+T}{cmr} \qquad \frac{600000+300000}{0.5} = 1800000$$

iii) Profit = $(p-v)x - f$

$$(200-100)8000 - 600000 = 200000$$

Or profit = $cmr \times R - f$

$$0.5 \times 8000 \times 200 = 800000 - 600000$$
$$= 200{,}000$$

iv) S.P

Profit = $(P-v)x - F$

$$300000 = (p-100)8000 - 600000$$
$$300000 = 8000p - 800000 - 600000$$
$$p - 100 = \frac{900000}{8000}$$
$$p - 100 = 112.5$$
$$p = 212.5$$

v) Margin of safety = $Budgeted\ or\ actual\ sales - BEP\ sales$

In units

$$8000 - 6000 = 2000$$
$$\%\ margin\ of\ safety$$

$$= \frac{2000}{8000} \times 100 = 25\%$$

In shillings

$= (8000 \times 200) - 1200000 = 400000$

(i) % margin of safety Margin of safety $= Budgeted\ or\ actual\ sales - BEP\ sales$

In units.

8000-6000=2000

$$\frac{2000}{8000} \times 100 = 25\%$$

CPA MAY 2016 Q 1b

(i) BEP in units = $\frac{F}{CM}$

F= 1300000

P = 1500

V = 1375

$$\frac{1300000}{1500 - 1375} = \frac{1300000}{125}$$

$= 10{,}400$Units

BEP shillings = $\frac{F}{cmr}$

$$cmr = \frac{p - v}{P} = \frac{1500 - 1370}{1500}$$

$$= 0.08333333$$

$$\frac{1300000}{0.0833333} = KSH.\ 15{,}600{,}000 units$$

(ii) Margin of safety $= Budgeted\ or\ actual\ sales - BEP\ sales$

In units.

$$16000 - 10400 = 5600 unit$$

Should the company sales fall below 5600 units it will begin to generate losses.

(iii) XT = $\frac{f+T}{cm} in\ units$

$$\frac{1300000 + 250000}{125} = 12400\ units$$

CVP ANALYSIS WITH SEVERAL PRODUCT/ MULTIPLE PRODUCTS

In the multiple product, where we had the contribution margin (cm) in the single product we replace it with the weighted average contribution margin (wacm) Where we had contribution margin ration (cmr) in the single product, we replace it with weighted contribution margin ratio (wacmr)

CPA JUNE 2008 Q2

(i) BEP

Gloss

Selling price per litre	**15000**		
	50000		**= 13**
Variable cost	90000		
	50000		= 1.8
F			= 30,000
BEP in units	F	30000	
	Cm	3-1.8	= 25000litre

BEP in shillings

$$cmr = \frac{p - v}{P}$$
$$= \frac{3 - 1.8}{3}$$
$$= 0.4$$
$$=$$

sh.75,000

(ii) BEP

Shine

Selling price per litre	15000		
	40000		= 3.75
Variable cost	45000		
	40000		= 1.125
F			= 84000
BEP in units	F	84000	
	Cm	3.75-1.125	= 32000litre

BEP in shillings

$$cmr = \frac{p - v}{P}$$
$$= \frac{3.75 - 1.125}{3}$$
$$= 0.7$$
$$=$$

sh.120,000

(iii) Weighted contribution margin (WACM)

=6+4 =10

(6/10X1.2) + (4/10X2.625) = 1.77

(iv) Combined BEP = $\frac{\text{Total fixed cost}}{\text{WACM}}$

$= \frac{30{,}000 + 84000}{1.77}$

$= \underline{64407 \text{Units}}$

(v) Weighted contribution margin ratio

Total units = 1+1= 2

WACMR = $\frac{1}{2}X0.4 + \frac{1}{2}X0.7 = \underline{0.55}$

(vi) BEP = $\frac{\text{Total fixed costs}}{\text{WACMR}}$

$= \frac{84000+30000}{0.55} = \underline{207272.7}$

2. APPLICATION OF MARGINAL COSTING

NON- ROUTINE DECESION

- These are short-term decisions not made on regular basis. These include:
  1. Product mix decisions
  2. Make or buy decision
  3. Drop or continue decisions
  4. Special offer decisions
- Not all costs are important and relevant for decision-making. Only relevant costs are considered for decision-making.

  Relevant Cost: It is the incremental costs or cost savings, which arise directly due to the decision made.
- For a cost to be relevant, it must meet all or any of the following requirements.
  1. **Future cost:** The cost, which has already been uncured, is historical cost and cannot be used for decision making. A relevant cost therefore must be a future cost which is yet to be incurred.
  2. **Incremental cost**: A relevant cost must be the extra cost, which arises as a consequence of the decision made. Regular payments such as salaries which are normally incurred and paid for at the end of each month are not incremental therefore not relevant.
  3. **Cash flows**- For a cost to be relevant it must constitute cash flows especially to the decision maker. Non-cash items such as depreciation, national rent, deferred tax etc. are not relevant for decision-making.

4. **Opportunity cost-** This is the contribution cost as a consequence of making alternative decision.

PRODUCT MIX WITH A LIMITING FACTOR DECISION.

A limiting factor is a scarce resource that prevents further production as the resource is not enough. The total demand for the Company's products cannot be satisfied because of this scarce resource and therefore the Company must determine how well to maximize profitability from the available resources.

Steps

1. Identify the limiting factor/unit of output
2. Compute the contribution per unit
3. Compute the contribution per limiting factor.
4. Rank the products based on three above.
5. Allocate available resources based on the ranking above.

CPA Dec 2009 Q 4

Limiting factor.

Labour hours at unit in testing department.

X = $\frac{150}{60} = 2.5\ hrs$

Y = $\frac{180}{60} = 3\ hrs$

Z = $\frac{300}{60} = 5\ hrs$

Shortfall hours

Required hours:

X =12000 x 2.5 = 30000

Y =7000 x 3 = 21000

Z = 9000x 5 = 45000

96000

Available hours

x= 10000 x 2.5 = 25000

Y= 5000x 3 = 15000

Z = 6000x5 = 30000

70000

Shortfall hours = 96000-70000=26000

1. Cm per unit
   = $p - v$

	X	Y	Z
P	1500	1900	2600
V	(1140)	(1220)	(1910)
CM	3600	680	690

2. Cm per limiting factor

$$\frac{360}{2.5} = 144 \quad \frac{680}{3} = 226.7 \quad \frac{690}{5} = 138$$

3. Ranking;
   1. Y
   2. X
   3. Z

4. **Optimal production mix**

Allocation of resources/available hours based on the ranking above.

Product	Hours allocated	units
Y	21000	7000
X	30000	12000
Z	19000/45000 x 9000	3800

c) Profit = $p - v)x - f$

Y	(1900-1220)7000 – (7000 x 200)	=3360000
X	(1500-1140)12000- (12000 x200)	=1920000
Z	(2600-1910)3800 – (3800 x200)	=1862000
		7142000

Other factors to consider in product mix decision

I. Contractual obligation – whether the company has contract to supply certain number of units to the customer.
II. Effects on sales of the other product i.e. if the customer normally buys all the product together.
III. Quality of the products – outsourced from external suppliers to cover the deficit.
IV. Whether the company is able to increase capacity by paying higher wages, increasing machine time through hiring more machines.
V. Effects on fixed cost if production reduces

DROPPING A PRODUCTION

Before a product is discontinued the total profit before discontinuation would be compared with the total profit after discontinuation. The general rule is that any product making positive contribution should not be discontinued

CPA MAY 2012 Q 1

AA	24000/15	=1600
BB	**1500/15**	**=1000**
CC	**16020/15**	**=1068**
DD	**27900/15**	**=1860**
Required hours		**5528**
Available hours		**(5000)**
Shortfall hours		**528hours**

Contribution

	AA	**BB**	**CC**	**DD**
Sales	90,000	44000	56000	64000
Less: Variable costs				
Direct Materials	20000	16000	22000	20000
Direct Labour	24000	15000	16020	27900
Variable overheads	6000	4000	6000	5000
Contribution	40000	9000	11980	11100
Contribution per limiting factor	40000/1600	9000/1000	11980/1068	11100/1860
	25	9	11	6
Ranking	1	3	2	4

PRODUCTION MIX

	hours	**units**
AA	1600	8000

CC	1068	3600
BB	1000	2000
DD	1332/1860*3720	2664
Hours Available		5000

Total profit with BB

AA	40,000
BB	9000
CC	11980
DD	11100
Total contribution	72080
Fixed cost	(42000)
Profit	30080

Profit without BB

AA	40000
CC	11980
DD	11100
Total contribution	63080
Fixed cost	(42000)
Profit	21080

The company should not discontinue the product BB since it will lead to a reduction in the total profit by sh.9000.

CPA DEC 2013 Q3

Neb ltd

Optimal production when we purchase component MT200

	A	B	C
Selling price	**112**	**136**	**153**
Less: variable costs			
Direct materials	**12**	**16**	**12**
Labour skilled	**16**	**24**	**8**
Labour unskilled	**18**	**12**	**9**
Variable overhead	**12**	**12**	**9**

Component	-	-	**80**
Contribution per limiting factor	**54/1**	**72/1.5**	**35/0.5**
	54	**4.8**	**70**
Ranking	**2**	**3**	**1**

A	16/16 = 1X2400	2400
B	24/16=1.5X2200	3300
C	8/16 = 0.5X3000	1500
	Hours required	7200
	Hours available	5400
	Shortfall	1800

Optimal production Mix

C	0.5X3000	= 1500 Hours
A	1x 2400	= 2400 Hours
B	1.5x 1000	= 1500 Hours
		5400 hours

Total contribution

A	54 X 2400	129600
B	72 X 1000	72000
C	35X3000	105000
Total contribution		306600

When component MT 200 is produced.

Changes in product C on production

Selling price	153
Less: Variable costs:	
Direct materials	12
Labour - Skilled	8
-unskilled	9
Variable overheads	9
MT 200	37
Contribution	78

	A	B	C
Contribution margin	54/1	72/1.5	78/1.5
	54	48	52
Ranking	1	3	2

OPTIMAL PRODUCTION MIX.

A 1 x2400 = 2400
B 1.5X2000=3000
C 1.5x 0 = 0
5400

Total contribution

	Contribution margin	
A	54x2400	129600
C	78x2000	156000
	Total contribution	285600

We go for a higher contribution. The company should purchase the component.

SPECIAL OFFERS/ORDERS

These are one –off contracts, which involves the decision of either accepting or rejecting an offer. To make such decision the variable cost of production and any other variable cost e.g. selling and distribution should be considered.

CPA JUNE 2010 Q3

Existing labour hour's capacity.

A	19.6/60X4560 = 1489.6
B	13/60X6960 = 1508
C	9.9/60X3480 = 574.2
D	17/60X2300 = 651.7
	4223.5Hours

Extra hours created for product A
From existing capacity 5% * 4223.5 = 211.175
From product B 13/60*2000 = 433.3
644.5hours

Extra units of A = 644.5hours / 19.6/60 = 1973units

ANALYSIS SCHEDULE

DROP B			**CONTINUE B**		
Sales revenue	A 1973x162	319626	Sales revenue	2000x116.4	232800
	B 2000x116.4	232800	Less: cost		
		552426	Material	2000x49	98000
Less costs:			Labour	2000x13	26000
Material costs A	1973x65.2	128639.6	Packaging	2000x7.4	14800
Labour cost A	1973x19.6	38670.8	Contribution		94000
Packaging cost A	1973x8.4	16573.2			
Purchase cost B	90%x116.4=104.76 2000 x 104.76	209520			
Contribution		159022.4			

The company should accept the offer since it leads to increase in contribution**.**

(b) The best product to outsource

	A	B	C	D	
Selling price	162	116.4	99.2	136.8	
Less: variable cost	93.2	69.4	56.5	78.2	
Contribution margin	68.8	47	42.7	58.6	
Contribution margin per limiting factor	68.8/0.327 =210.4	47/0.217 =216.6	42.7/0.165 =258.8	58.6/0283 =207.1	
Ranking	3	2	1	4	

The product to outsource is the one that gives the lowest contribution per limiting factor therefore outsource product D

OTHER FACTORS TO CONSIDER BEFORE DISCONTINUING PRODUCTION

1. If the product is making losses.
2. Effect on the employees/workers i.e. if it requires them to be laid off should the product be discontinued.
3. The goodwill of the company i.e. if it will affects the loyal customers then the product should not be dis-continued
4. The trade union action.
5. The usage of the fixed costs.
6. Availability of input resources.