ISCTE/IUL BUSINESS SCHOOL

MANAGEMENT ACCOUNTING I - 2014/2015

ADDITIONAL CASES - SOLUTIONS

Case A

1. To identify the costing system we present a table with the calculations of MCFP, MCPS and NPMC for the absorption costing, rational costing and variable costing systems, considering the different degree of incorporation of the manufacturing fixed costs.

But firstly it is necessary to ascertain:

- Quantities sold: $90\ 000/15 \in = 6\ 000\ tons.$
- Quantities produced: $6\ 000\ tons + 1\ 500\ tons = 7\ 500\ tons.$
- Manufacturing variable costs: $2.5 \in x \ 7 \ 500 = 18 \ 750 \in x \ 7 \ 500 = 18 \ 750 \in x \ 7 \ 500 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 750 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0 = 18 \ 0$
- Manufacturing fixed costs: 22 500 €/0.75 = 30 000 €
- NPMC, using RC costing system = $30\ 000 \in -22\ 500 \in =7\ 500 \in$

	AC System	RC System	VC System
1. MCFP			
Manuf. fixed costs	30 000 €	22 500 €	0
Manuf. variable costs	18 750 €	18 750 €	18 750 €
Total	48 750 €	41 250 €	18 750 €
2. Quant. produced	7 500 tons	7 500 tons	7 500 tons
3. Unit MCFP	6.5€	5.5€	2.5 €
4. Quant. sold	6 000 tons	6 000 tons	6 000 tons
5. MCPS (SC)	39 000 €	33 000 €	15 000 €
6. NPMC	0	7 500 €	30 000 €
7. $SC + NPMC$	39 000 €	40 500 €	45 000 €

The profit and loss statement presented is presented using the rational costing system.

2. Using the concept of break-even point, the profit may be easily estimated, knowing that the variable costing system was used.

So:

$$Q' = \frac{costs}{sp - sc}$$
 where

Fixed costs = Manufacturing fixed costs + non-manufacturing fixed costs: $30\ 000\ \notin + 6\ 000\ \notin + 15\ 000\ \notin + 10\ 000\ \notin = 61\ 000\ \notin$

1

sp = unit selling price: 15 €

- uvc = unit variable costs, manufacturing and non-manufacturing: manufacturing vc = 2.5 € non-manufacturing vc = 1 800 €/6 000 tons = 0.3 €
- Replacing in the formula mentioned above, we have: $Q'=61\ 000\ \epsilon/(15\ \epsilon-2.8\ \epsilon)=61\ 000\ \epsilon/12.2\ \epsilon=5\ 000\ tons$

So the estimated profit (Ep) is: Ep = $(Q - Q') \times m$ Ep = $(6\ 000\ tons - 5\ 000\ tons) \times 12.2 \in = 12\ 200 \in$

3. The difference of profits is justified by the different manufacturing fixed costs which are incorporated in P&L statement whether in MCPS or in NPMC, as it can be seen in the following table:

	RC System	VC System	Difference
Profits	16 700 €	12 200 €	+ 4 500€
Manufacturing fixed costs incorporated in P&L statement			
- in MCPS	22 500 €/7 500 tons		
	18 000 €	0	
- in NPMC	7 500 €	30 000 €	
Total	25 500 €	30 000 €	- 4 500 €

4. The difference of profits may also be justified by the variation of stocks

	RC System	VC System	Difference
Profits	16 700 €	12 200 €	+ 4 500 €
Closing stocks	14 250 = 1 000x6	6 250 =	
	+ 1 500x5.5	1 000x2.5	
		+	
		1 500x2.5	
Opening stocks	$6\ 000 = 1\ 000 \text{x}6$	2 500 =	
		1 000x2.5	
Variation of stocks	8 250 €	3 750 €	+ 4 500 €

Case A1

1. Profit and loss statement per functions using the rational and variable costing systems

Calculation of MCFP, MCPS and NPMC using the rational costing system:

 $MCFP = 6\ 000x8 + 24\ 000x \quad \frac{6\ 000}{8\ 000} = 66\ 000$

Unit MCFP = $\frac{66\,000}{6\,000} = 11$

MCPS = 1 500x11+3 500x11 = 55 000

 $NPMC = 24\ 000x0.25 = 6\ 000$

Calculation of MCFP, MCPS and NPMC using the variable costing system: $MCFP = 6\ 000x8 = 48\ 000$

Unit MCFP = $\frac{48\,000}{6\,000} = 8$

 $MCPS = 1\ 500x8 + 3\ 500x8 = 40\ 000$

NPMC = 24 000

Profit and loss statement

	RC System	VC System
Sales	100 000	100 000
Sales cost	55 000	40 000
Subtotal	45 000	60 000
NPMC	6 000	24 000
Gross profit	39 000	36 000
Distribution costs		
Variable	7 500	7 500
Fixed	7 500	7 500
Administration costs	15 750	15 750
Operational profit	8 250	5 250

2. Justify the difference in profits

Profit using RC System	8 2 5 0
Profit using VC System	5 2 5 0
Difference	3 000

Justification using the valuation of the variation in stocks

	RC System	VC System
Closing stock	$2\ 500 \mathrm{x11} = 27\ 500$	$2\ 500x8 = 20\ 000$
Opening stock	$1\ 500 \mathrm{x} 11 = 16\ 500$	$1\ 500x8 = 12\ 000$
Variation of stocks	11 000	8 000

Justification using the manufacturing fixed costs that are period cost

RC System		VC	VC System	
Manufacturing				
fixed costs	1 500x(11-8)+	$\frac{18000}{6000}$	x3 500+6 000 = 21 000	24 000

Case B

Preliminary calculations:

	Sales (units)	Profit/(loss)
November	30 000	40 000
December	35 000	60 000
Increase	5 000	20 000

An increase in sales of 5 000 units increases contribution (profits) by 20 000 \in . Therefore contribution is 4 \in per unit. Selling price is 10 \in per unit (given) and variable cost per unit will be 6 \in . At 30 000 unit sales:

Contribution - fixed costs = profit \Leftrightarrow 120 000 - Fixed costs = 40 000 \Leftrightarrow Fixed costs = 80 000€

The above information can now be plotted on a graph. A break-even chart or a profit-volume graph could be constructed. A profit-volume graph avoids the need to calculate the profits since the information can be read directly from the graph (See figure 1 for a break-even chart and Figure 2 for a profit-volume graph).

<u>(a)</u>

- <u>**i.**</u> Fixed costs = 80 000€
- **<u>ii.</u>** Variable cost per unit = $6 \in$
- **<u>iii.</u>** Profit-volume = contribution (4ϵ) / selling price per unit 40%
- **<u>iv.</u>** Break-even point = 20 000
- Y. The margin of safety represents difference between actual or sales volume and the breakpoint. Therefore the margin of will be different for each sales. For example, the margin in November is 10 000 units units – 20 000 units). The safety can be read from Figure various sales levels. (b) and (c).



Case C

Workings:	(000)
Sales	1 000
Variable Costs	600
Contribution	400
Fixed Costs	500
Profit/(loss)	(100)

- Unit selling price = 20€ (1 000 000€ / 50 000)
- Unit variable $cost = 12 \in (600\ 000 \in /\ 50\ 000)$
- Unit contribution = 8€
- (a) Sales commission will be 2€ per unit, thus reducing the contribution per unit to 6€. The break-even point will be 83 333 units (500 000/6€) or 1 666 666 sales value. This requires an increase of 67% on previous sales and the company must assess whether or not sales can be increased by such a high percentage.
- (b) A 10% decrease in selling price will decrease the selling price by 2€ per unit and the revised unit contribution will be 6€:

	(€)
Revised total contribution (65.000 * 6€)	390 000
Less fixed costs	500 000
Profit / (loss)	(110 000)

The estimated loss is worse than last year and the proposal is therefore not recommended.

(c) Wages will increase by 25% - that is, from 200 000€ to 250 000€ - causing output to increase by 20%.

		(€)		
' (ل)	Sales		1 200 000	Dovi
(u)	Direct materials and variable overheads	480 000		sed
	Direct wages	250 000	730 000	
	Contribution		470 000	
	Less fixed costs		550 000	
	Profit / (loss)		80 000	

selling price = $24 \in$

Let X = Revised sales volume

Sales revenue less (variable costs + fixed costs) = Profit

24X less (12X + 800 000) = 0.1(24X) 9.6X = 800 000 X = 83 333 units

Clearly this proposal is preferable since it is the only proposal to yield a profit. However, the probability of increasing sales volume by approximately 67% plus the risk involved from increasing fixed costs by 300 000 must be considered.

Case D

1 – Break-even point in units (Q')

Q' = Fixed costs/unit contribution margin = $60\ 000$ € = 6 000 tickets 10€

2 – Units to be sold to obtain a 30 000€ profit

Q = ?

30 000€ = Q x (20€ – 10€) – 60 000€

Q = <u>90 000€</u> = 9 000 tickets 10€

3 – Profit from the sale of 8 000 tickets

P = 8 000 x (20€ - 10€) - 60 000€ P = 20 000€

4 – Selling price to be charged to show a profit of 30 000£ on sales of 8 000 tickets

30 000 = 8 000 x (sp - 10€) - 60 000€ 8 000 x sp = 170 000€ Sp = 21.25€ (an increase of 1.25€ per ticket)

5 – Additional sales volume to meet 8 000€ additional fixed advertising charges

20 000€ = Q x (20€ - 10€) – (60 000€ + 8 000€)

10 x Q = 88 000€

Q = 8 800 tickets

Additional tickets = 8800 - 8000 = 800 tickets

<u>Case E</u>

i) Break-even point (Q') = Fixed costs/(sp-uvc) = $\underline{110\ 000 \notin +20\ 000 \notin +30\ 000 \notin}$ = (3.3€ - 1.3€) <u>160 000€</u> = 80 000 units 2€ Sp = 3.3 € $uvc = \underline{120\ 0000} + \underline{9\ 0000} = 1.30$ 100 000 90 000 ii) Margin of safety (MS) = <u>90 000 - 80 000 x</u> 100 = 12.5% 80 000 iii) P = Q x (sp-uvc) - Fixed costs50 000€ = Q x (3.3€ - 1.3€) - 160 000€ $Q = 210\ 000 \in = 105\ 000\ units$ 2€ P = Q x (sp-uvc) - Fixed costsiv)

50 000€ = 90 000 x (sp - 1.3€) – 160 000€

210 000€ = 90 000 x sp - 117 000€

sp = <u>327 000€</u> = 3.63€ 90 000

v)
$$P = (Q-Q') x (sp-uvc) = (Q-Q') x m = (110\ 000 - 80\ 000) x 2€ = 60\ 000€$$

Case F

1. Costs allocation at the first split-off point

The first split-off point comes up after the washing and peeling section, from which the intermediate product 'pieces of peach' and the by-product 'peels' are produced.

The Joint Costs at this first split-off point are:

- Peach 35 000 kgs x 0,40 €/Kg = 14 000 €
- Washing and Peeling <u>40 000 €</u> 54 000 €

To the joint costs we must take out the net realizable value from the by-product, and obtain the joint costs to allocate to by-product:

- Potential value of sales $3500 \text{ kg x } 5 \in = 17500 \in$
- Specific costs of packing
 <u>(100) €</u> 17 400 €

Observation: It's assumed that by-products do not have specific distribution costs.

Therefore, the joint costs to assign at the first split-off point are: 54 000 \in - 17 400 \in = 36 600 \in

2. Costs allocation at the second split-off point

The joint costs at the second split-off point come from peach pieces and from the grinding section, from where it is produced the peach pulp, juices and some other fruit wastes.

Adding water and sugar to the peach pulp, after the process at the preparation and packing section, it is produced the Joint Product A - Jam.

The Juices are produced at the Liquefaction section.

The Joint Costs at this second Split-off point are:

- Peach Pieces 36 600 €
- Grinding process <u>12 000 €</u> 48 600 €

The following table shows how the joint costs shall be apportioned (allocated) to the Jam and Juices.

					(€)	
Products	SV from Production	Specific Costs		SV at Spl poin	lit-off t	Joint Costs
		Manufact.	Non	Value	%	
			Manufact			
Jam	210 000	30 000	4 200	175 800	87,02	42 292
Juices	40 000	13 000	800	26 200	12,98	6 308
Total	250 000	43 000	5 000	202 000	100	48 600

The value of sales of the production is calculated taking into account that all the production is sold:

Jam:

210 000 € = 4.2 × 50000

Juices:

40000€ = 2.00 × 20 000

Manufacturing Specific Costs:

- Jam
 - Preparation 10 000 €
 - Packing 20 000 € 30 000 €
- Juices
 - Liquefaction 3 000 €
 - Packing 10 000 € 13 000 €

The Specific Non Manufacturing Costs are 2% on the potential sales value.

3. Cost of the products

		(€)							
Products	Joint Costs	Specific Industrial Costs	Cost of the products (MCFP)	Unit MCFP					
	(1)	(2)	(3) = (1) + (2)	(4) = (3) / QP					
Jam	42 292	30 000	72 292	1.44584					
Juices	6 308	13 000	19 308	0.9654					
Total	48 600	43 000	91 600	-					
Peels	17 400	100	17 500	5.00					

4. P&L (Income) Statement

			(€)	
Description	Jam	Juices	Peels	Total
Sales	147 000.00	35 000.00	15 000.00	197 000.00
Sales Cost (SC)	50 604.40	16 894.50	15 000.00	82 498.90
Gross Profit	96 392.10	18 109.87	0	114 501.10
Distribution costs				
Variable	2 940	700		3 640
Fixed				4 500
Administration Costs				10 000
Profit				96 361.10

Case G

1. Allocation of the indirect costs using a criterion of unique basis.

Taking into account that the indirect costs are allocated in proportion to the number of labour hours, the allocation unit corresponds to:

AU=
$$\frac{Indirect costs}{No. of labour hours} = i$$
 $\frac{31\,690}{1\,250} = 25.352$ €/hour

Per product the indirect costs would be:

Description MU		Unit cost	BP_	SP	
Indirect costs	€	25.352	540x25.352=13 690	710x25.352=18 000	

Regarding the materials consumption and using LIFO, it would be obtained: Acrylic:

- oS 100 x 23.94
- Purchases 1 200 x 25
- Consumptions 1 100 x 25

PVC

- oS 120 x 4.49
- Purchases 2 200 x 5
- Consumptions 1 960 x 5

The table of MCFP is:

Description	MU	Unit cost	BP		SP	1
_		(€)	200		25	0
			Q	€	Q	€
1 - Materials						
Acrylic	m	25	600	15 000	500	12 500
PVC	m	5	970	4 850	990	4 950
Total (1)				19 850		17 450
2 – Conversion	l/h	25.352	540	13 690	710	18 000
costs						
3 - MCMP				33 540		35 450
4 - Var. PiP						
Opening stock				2 900		850
Closing stock				1 050		750
5 - MCFP				35 390		33 550
Unit MCFP				176.95		142.20

2 – Allocation of indirect costs using a criterion of multiple basis.

To allocate the indirect costs to the different manufacturing stages, defining to each one of them an allocation basis, we have firstly to calculate the allocation unit of each operation:

AU (Cut) = $\frac{Indirect costs}{No. of labour hours}$ = $\frac{19270}{500}$ = 38.54 €/hour

AU (Assembly) =
$$\frac{Indirect costs}{No. of labour hours} = \frac{12420}{750} = 16.56 \text{ €/hour}$$

According to this hypothesis, the indirect costs to allocate to the products cost will result from:

Description	Unit cost	BP		SP		
	(€)	Q	€	Q	€	
Cut	38.54	225	8 672	275	10 598	
Assembly	16.56	315	5 216	435	7 204	
Total			13 888		17 802	

According to this method the costs allocated to each product point out the use that each one of them made of the available resources.

As the direct costs are the same, the table of MCFP is:

Description	MU	Unit cost	BP		SP	
		(€)	200		250)
			Q	€	Q	€
1 - Materials						
Acrylic	m	25	600	15 000	500	12 500
PVC	m	5	970	4 850	990	4 950
Total (1)				19 850		17 450
2 – Conversion	l/h					
costs						
Cut		38.54	225	8 672	275	10 598
Assembly		16.56	315	5 216	435	7 204
Total (2)				13 888		17 802
3 - MCMP				33 738		35 252
4 – Var. PiP						
Opening stock				2 900		850
Closing stock				1 050		750
5 - MCFP				35 588		35 352
6 – Unit MCFP				177.94		141.408

<u>Case H</u>

1. Calculation of the monthly costs using the absorption costing system.

i) Ascertainment of the cost of the cost centres.

Analysing the test sheet it is possible to see that in this case there are:

- Two main cost centres Manufacturing and Packing
- Two supporting cost centres Maintenance and Common Expenses;

The following table allows to ascertain the monthly cost of the cost centres:

Description	MU	UC	Manuf. 720 m/h		Packing 600 m/h		Mainten. 250 l/h		Common Expenses 404 800€	
			Q	€	Q	€	Q	€	Q	€
1. Direct cost										
1.1 V.C.	€			36 800		24 000		4 200		-
1.2. F.C.	€			180 000		156 200		3 600		12 600
Total (1)				216 800		180 200		7 800		12 600
2. Reallocation of										
support. cost centres										
-Maintenance	l/h	32.172	150	4 826	100	3 217	-	-		-
-Common expenses	€	0.031		6 748		5 609		243		-
Total (2)				11 574		8 826		243		-
3. Conversion costs				228 374		189 026		8 043	?	12 600
WU				317.1861		315.0433		32.172		-
AU								_		0.031126
CU								-		406.45

Allocation unit of the cost centre of Common Expenses =

 $\frac{12600}{216800+180200+7800} = \frac{12600}{404800} = 0.031126 \notin$

ii) Ascertainment of the Production Cost (MCFP)

Note: The additives consumption is shown in $\boldsymbol{\epsilon}$.

The table which is now presented corresponds to the calculation of the products cost (MCFP):

Description	MU	Unit cost	Produ 60 00	ct R 0 kg	Product RC 40 000 kg		
			Q	€	Q	€	
1. RM							
Flour	kg	0.5	45 000	22 500	30 000	15 000	
Sugar	kg	0.7	9 000	6 300	6 000	4 200	
Chocolate C.	kg	5	-	-	2 000	10 000	

Vegetable fat	kø	0.8	6 000	4 800	4 000	3 200
		0.0	120.000	(000	0000	1 000
Cardboard boxes	un	0.05	120 000	6 000	80 000	4 000
Additives	€			900		600
Total (1)				40 500		37 000
2. Convers. costs						
Manufacturing	m/h	317.1861	400	126 874	320	101 500
Packing	m/h	315.0433	360	113 416	240	75 610
Total (2)				240 290		177 110
3. Total MCFP				280 790		214 110
Unit MCFP				4.67983		5.35275

iii) Calculation of Gross Profit (€)

Description	Product R 40 000 kg	Product RC 40 000 kg	Total
Sales	252 000	268 000	520 000
Sales Cost	187 193	214 110	401 303
Gross profit	64 807	53 890	118 697

2. Calculation of the monthly costs using the variable costing system

The adoption of the variable costing system implies that only the costs of variable nature must produce an effect in the product cost. This means that the manufacturing fixed costs are globally calculated and are included in the Profit and Loss Statement per Functions – NPMC.

i) Ascertainment of the cost of the cost centres – variable costs

In the calculation of the variable costs of the manufacturing sections (cost centres), the variable direct costs and the reallocation of support cost centres are considered when they correspond to services rendered regarding manufacturing sections (cost centres) of variable costs.

Description	MU	UC	Manufacturing 720 mhQ€		Packing 600 mh		Maintenence 250 lh	
					Q	€	Q	€
1. Direct costs	€							
1.1 Variable costs				36 800		24 000		4 200
Total (1)				36 800		24 000		4 200
2. Reallocation of								
supp. cost centres								
Maintenance	lh	16.80	150	2 520	100	1 680	-	-
Total (2)				2 520		1 680		-

3.Conversion costs		39 320	25 680	4 200
WU		54.611	42.8	16.9
AU				-
CU				-

ii)Ascertainment of the Production Cost (MCFP)

Comparing with the resolution using the absorption costing system, it is important to consider the changes registered in the value of the work units of the main cost centres.

Description	MU	Unit cost	Produ 60 00	ict R 0 kg	Product RC 40 000 kg		
			Q	€	Q	€	
1. RM							
Flour	kg	0.5	45 000	22 500	30 000	15 000	
Sugar	kg	0.7	9 000	6 300	6 000	4 200	
Chocolate coating	kg	5	-	-	2 000	10 000	
Vegetable fat	kg	0.8	6 000	4 800	4 000	3 200	
Cardboard boxes	un	0.05	120 000	6 000	80 000	4 000	
Additives	€			900		600	
Total (1)				40 500		37 000	
2. Conversion costs							
Manufacturing	mh	54.6111	400	21 844	320	17 476	
Packing	mh	42.8	360	15 408	240	10 272	
Total (2)				37 252		27 748	
3. Total MCFP				77 752		64 748	
Unit MCFP				1.29587		1.6187	

iii) Calculation of the Gross Profit

Description	Product R	Product RC	Total		
	40 000 kg	40 000 kg			
Sales	252 000	268 000	520 000		
Sales costs	51 835	64 748	116 583		
Subtotal	200 165	203 252	403 417		
NPMC			352 400		
Gross Profit			51 017		

NPMC correspond to the Manufacturing Fixed Costs, that is, the direct fixed costs - variable manufacturing sections (cost centres) or fixed manufacturing sections (cost centres) (values in €):

-	Manufacturing	180 000
-	Packing	156 000
-	Maintenance	3 600

- Common Expenses 12 600 352 400 €

3. Justification for the profits difference

Description	Absorption costing system	VC System	Difference
Gross Profit	118 697	51 017	67 680

Closing stocks of R = 20 000 (4.67983-1.29587) = 67 680 €

Case I

1. Table of Conversion Costs

Analysing the test sheet it is possible to see that in this case there are:

- Three main cost centres Cut and folding, Assembly and Painting
- Two supporting cost centres Repair shops and Common Expenses

The table regarding the supporting cost centres is as follows:

			Common Expenses	Repair shops
Description	MU	UC		1200 lm

			Q	€	Q	€
1. Direct costs				9 250		3 240
Total (1)				9 250		3 240
2. Reallocation of						
support. cost centres						
Repair shops	lh	2.7	120	324	-	-
Common exp.						
Total (2)				324		-
3. Conversion costs				9 574		3 240
WU				-		2.7
AU				-		
CU				308.84		

The table regarding the main cost centres is as follows:

Description	MU	U C	Cut and folding 2 000 mh		Ass 10	embly 000 lh	Painting 2 500 unit		
			Q	€	Q	€	Q	€	
1. Direct costs				43 900		30 000		40 000	
Total (1)				43 900		30 000		40 000	
2. Reallocation of									
support. cost centres									
Repair shops	lh	2.7	300	810	380	1 0 2 6	400	1 080	
Common exp.				4 787		4 787		-	
Total (2)				5 597		5 813		-	
3. Conversion costs				49 497		35 813		41 080	
WU				24.7485		3.5813		-	
AU								16.432	
CU								1325.16	

2. Table of the Production Costs

Table of the intermediate products cost – Profiles and Plates:

Description	MU	Unit	Pro 11	ofiles 000	Plates 8 000		
		Cost	Q	€	Q	€	
1.RM							
Angle bar	unit	7	16 000	112 000	-	-	
Sheet	unit	140	-	-	5 000	700 000	
Total (1)				112 000		700 000	
2.Conversion							
costs							
Cut	mh	24.7485	1 000	24 749	1 000	24 748	
Total (2)				24 749		24 748	
3. Total MCFP				136 749		724 748	

Description	MU	Unit	Stru 1	ictures I 500	Structures II 1 000		
		Cost	st Q		Q	€	
1. RM							
Profiles	unit	12.43173	5 500	68 375	5 500	68 375	
Plates	unit	90.5935	5 000	5 000 452 968		271 781	
Total (1)				521 343		340 156	
2.Conversion							
costs							
Assembly	lh	3.5813	6 000	21 488	4 000	14 325	
Painting		16.432	1 500	24 648	1 000	16 432	
Total (2)				46 136		30 757	
3. Total MCFP				567 479		370 913	
Unit MCFP				378.31933		370.913	

Table of the finished products costs – Structures I and Structures II:

3. Gross Profit

Description	Structures I	Structures II	Total		
	1 500	1 000			
Sales	645 000	425 000	1 070 000		
Sales Costs	567 479	370 913	938 392		
Gross profit	77 521	54 087	131 608		

4. Ascertainment of the selling price

Structures I => sp = 378.31933 + 0.18 x sp => sp = 461.365 €/unit

Structures II => sp = 370.913 + 0.18 x sp => sp = 452.3329 €/unit

<u>Case J</u>

1. Table of the Conversion costs

Analysing the test sheet it is possible to realize that in this case there are:

- Two main cost centres Concrete Centre and Cement Mixer
- One supporting cost centre Repair Shops
- One supply cost centre Silos, whose costs are allocated using the inputs criterion (quantity of cement bought)

The following table (conversion costs) ascertains the monthly cost of the cost centres:

Description	MU	UC	Concrete Centre 150 mh		Cement Mixer 1 200 mh		Silos 1 000 ton		Repair shops 700 lh	
			Q	€	Q	€		€	Q	€
1. D				5 7 (0)		14705	Q	1.046		10.015
1. Direct Costs				5 760		14 795		1 046		12 215
Total (1)				5 760		14 795		1 046		12 215
2. Reallocation of										
supp. cost centres										-
Repair shops	lh	17.45	200	3 490	500	8 725	_	-		
Total (2)				3 490		8 725		-		-
3. Conversion costs				9 250		23 520		1 046		12 215
WU				61.66(6)		19.6		-		17.45 (1)
AU								1.046		-
CU								33.74(2)		-
$1)12\ 215/700 = 17.45$ 2) 1 046/31 days = 33.74										

2.Table of the Production Cost

• Ascertainment of the Purchases Cost – Allocation criterion => Quantity cement bought

The allocation of the Silos cost to the purchase cost corresponds to $1.046 \notin$ /ton of cement bought. External Cost = Quant. Bought x unit cost acquisition => $1\ 000x65.00 = 65\ 000 \notin$ Internal Cost = Quant. Bought x Silos AU => $1\ 000x1.046 = 1\ 046 \notin$ Global Cost = External Cost + Internal Cost => $65\ 000+1\ 046 = 66\ 046 \notin$

Unit cost = $\frac{Global Cost}{Quantity bought} \implies \frac{66\,046}{1\,000} = 66.046 \, \text{e/ton}$

• Table of the Production Costs

Description	MU	MU Unit cost Concre			
			Q	€	
1. RM					
Cement	ton	66.046	800	52 831	
Gravel	m ³	10.00	2 500	25 000	
Sundries	m ³	3.00	720	2 160	
Total (1)				79 991	
2. Conversion costs					
Concrete cost	mh	61.66(6)	150	9 250	

Cement mixer	mh	19.6	1 200	23 520
Total (2)				32 770
3. Total MCFP				112 761
Unit MCFP				37.587

3. Ascertainment of the selling price to fix

sp = 37.587+0.1xsp =>41.763 €/m³

Case K

1. Table of the costs of centres (conversion costs)

The following cost centres are defined:

- Main cost centres Medical consultations, Analyses Centres and Radiology Centre;
- Supporting cost centres Common Expenses, whose costs are allocated to cost centres in proportion to the respective direct costs;
- Supply cost centre Pharmacy/Laboratory, whose costs are allocated according to the products incorporated in the service (outputs criterion).

As there is only one supporting cost centre which comprises only direct costs, the respective allocation unit is now ascertained so as to allocate its costs to the main cost centres.

 $AU = \frac{Total costs}{Allocation basis} = \frac{8118}{16920 + 12300 + 24900} = \frac{8118}{54120} = 0.15$

The table regarding the costs calculations of the other cost centres (conversion costs table) is the following:

Description	MU	UC	Ме 1	edical cons. 440 lh	An	aly. Centre 300 un	Ra 2	diol. Centre 2 500 un	Ph 32	arm/Lab. 200 €*
			Q	€	Q	€	Q	€	Q	€
1.Direct costs				16 920		12 300		24 900		16 100
Total (1)				16 920		12 300		24 900		16 100
2. Realloc. of supp.										
c. centres										
Common expenses	€	0.15		2 538		1 845		3 735		-
Total (2)				2 538		1 845		3 735		-
3.Conversion costs				19 458		14 145		28 635		16 100
WU				13.5125		4.715		11.454		-
AU										0.5
CU										519.35

*Chemical/pharmaceutical products incorporated = 45 050+25 450-38 300 = 32 200 €

2. Table of the costs of services rendered

Description	UC	Medical consult. 4 320			Analyses 3 000	X-rays 2 250		
I I I I		Q	€	Q	€	Q	€	
1.Mat.Incorpor.								
Ph./chem. products			12		19 320		_	
Radiol. products			-		-		21 610	
Total (1)			12 880		19 320		21 610	
2.Conversion costs								
Medical consult.			19 458		-		-	
Analyses centre			-		14 145		-	
Radiology centre					9 660		28 635	
Pharm./Laboratory		0.5	6 440				-	
Total (2)			25 898		23 805		28 635	
3.Services cost			38 778		43 125		50 245	
4.Unit cost			8.97639		14.375		22.331(1)	

Consumptions Radiology Products = 13 400 + 18 430 − 10 220 = 21 610 €

3.Ascertainment of Gross Profit

Description	Medical	Analyses	X-rays	Total
	consultations			
Sales	108 000	48 450	78 750	235 200
Sales Cost	38 778	43 125	50 245	132 148
Gross profit	69 222	5 325	28 505	103 052

Case L

1. Table of Production Costs

In February, year N, this company finished and sold Job X and continued to produce Job Y, although it had not been finished, and began the production of Job Z.

Description	MU	Unit	Jo	b X	į	Job Y	Jo	ob Z
		Cost (€)	Q	€	Q	€	Q	€
1.Direct materials								
Mechanics materials	€			2 000		1 400		1 000
Electricity materials	€			1 600		3 000		3 800
Putties	€			420		200		100
Paints	€			1 800		1 400		1 100
Total (1)				5 820		6 000		6 000
2.Conversion costs								
Mechanics repair shop	lh	72	90	6 480	12	8 640	80	5 760
					0			
Electricity repair shop	lh	54	120	6 480	60	3 240	80	4 320
Panel beating	lh	78	80	6 240	70	5 460	90	7 020
Painting	lh	42	190	7 980	16	6 720	150	6 300
					0			
Total (2)				27 180		24 060		23 400
3.Monthly costs				33 000		30 060		29 400
4.Costs at the beginning of				3 000		2 040		-
the month	€							
5.Costs of the finished work	€			36 000		-		-
6.Costs of work in progress	€			-		32 100		29 400

The following table presents the calculation of the costs, up to the end of September, of the different jobs regardless of their situation at that time.

The unit of the cost centres is the result of the division of the absorption cost by the respective activity:

- Mechanics repair shop: 20 880 €/290 lh = 72.00 €/lh
- Electricity repair shop: $14\ 040\ \text{€}/260\ \text{lh} = 54.00\ \text{€}/\text{lh}$
- Panel Beating Manufacturing Section: 18 720 €/240 lh = 78.00 €/lh
- Painting Manufacturing Section: 21 000 €/500 lh = 42.00 €/lh

2. Profit and Loss statement per functions

As this company only finished and sold Job X in February, year N, the gross profit corresponds to the difference between the sales value of this production line and the respective production cost.

Description	Job X (€)
Sales	60 000
Sales cost	36 000
Subtotal	24 000
NPMC	0
Gross profit	24 000
Distribution costs	1 000
Administration costs	7 000
Operational profit	16 000
Financing income	-

Financing costs	8 000
Profit before taxes	8 000

3. If the variable costing system were used, do assume that 70% of the opening costs of the jobs would be variable.

Before ascertain the job cost priced in this month, we should calculate the costs of the cost centres using VC System:

- Mechanics repair shop: 10 080 €/290 lh = 34.75862 €/lh
- Electricity repair shop: 8 240 €/260 lh = 31.69231 €/lh
- Panel Beating Manufacturing Section: 9 120 €/240 lh = 38.00 €/lh
- Painting Manufacturing Section: 11 200 €/500 lh = 22.40 €/lh

The variable costs associated with job X would be:

Description	UF	Unit cost		Job X
		(€)	Q	€
1.Direct materials				
Mechanics materials	€			2 000
Electricity materials	€			1 600
Putties	€			420
Paints	€			1 800
Total (1)				5 820
2.Conversion costs				
Mechanics working shop	lh	34.75862	90	
Electricity working shop	lh	31.69231	120	
Panel beating	lh	38.00	80	
Painting	lh	22.40	190	
Total (2)				
3.Monthly costs				
4.Cost at the beginning of the month	€			
5.Cost of the finished work	€			

NPMC would correspond to the sum of the direct fixed costs of alle cost centres, that is, $36\ 000 \in (8\ 000 + 4\ 000 + 7\ 000 + 10\ 000)$.

Therefore, monthly profit would be the following:

Description	Job X (€)
Salar	60.000
Sales cost	00 000
Subtotal	
NPMC	
Gross profit	
Distribution costs	
Administration costs	

Operational profit	
Financing income	
Financing costs	
Profit before taxes	