Institute of Incorporated Public Accountants

Module 13:

Advanced Management Accounting

August 2015 SOLUTIONS

Question 1 (a)	Batches	Unit Costs	Zalon	Batches	Unit costs	Deetron	6.00
External Sales	116	€4,700	€545,200	84	€12,000.00	€1,008,000	1.00
Internal sales	84	€4,700	€394,800	N/A			0.50
T.V.C of external sales	116	€3,431	(€397,996)	84	€6,100.00	(€512,400)	1.00
T.V.C of internal sale	84	€3,431	(€288,204)	N/A			0.50
Transfer in cost price			N/A	84	€4,700.00	(€394,800)	0.50
Contribution ext. sales			€147,204			€100,800	0.50
contribution from int, sales			€106,596				0.50
Total fixed costs	158	€540.00	(€85,320)	84	€500.00	(€42,000)	1.50
Net Profit			€168,480			€58,800	

Sales prices
(i) Zalon   €3,431/73% i.e.[100%-27%] =€4,700

(ii) Deetron €6,100 +€4,700=€10,800/90% equals €12,000

Splitting of sales between internal and external,included for info only   **[6 marks]**

(b) At 58% activity [116 batches] Zalon has spare capacity to produce the 84 batches.

As both divisions are side by side then delivery costs should be excluded.
Thus the minimum cost is €3,431 less €256 delivery costs equals €3,175.   [2 marks]

At 79% activity level [158 batches]Zalon has only 42 batches spare capacity.
Thus the other 42 batches will incur an opportunity cost equal to the contribution forgone
by not selling on the external market.
Therefore the minimum cost would include not only the variable costs excluding the
delivery costs but also the opportunity cost of the contribution foregone on the 2nd group
of 42 batches that could have been sold on the outside market.
The computed total of €319,998 is set out below and which when divided by 84 batches
gives an average minimum cost per batch of €3,809.50
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Minimum Cost		Unit costs	Total Variable Cost
Total variable costs	84	€3,431	€288,204
Less delivery costs	84	(€256)	(€21,504)
		€3,175.00	€266,700
Opportunity costs	42	€1,269.00	€53,298

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| | | 84 | €3,809.50 | €319,998 | |

Question 1 (c)

The offer by Bryon Ltd to sell 42 batches for €3,375 each.

As already indicated it is cheaper to produce the first group of 42 batches of the total of 84 batches within the firm because there is that spare capacity in the Zalon division.

In relation to the <u>second</u> group of 42 batches the savings would be

Batches	per Batch	Total	
42	€3,175.00	€133,350	Compound Ltd -Zalon division
42	€1,269.00	€53,298	Compound Ltd -Zalon division
42	€4,444.00	€186,648	Total
42	€3,375.00	€141,750	Byron Ltd
42	€1,069.00	€44,898	Savings from order of 42 batches

<u>The offer by Bryon Ltd to sell 84 batches for €3,300.each.</u>

The offer of a quantity discount would result in savings as follows

Batches	per Batch	Total	
84	€3,175.00	€266,700	Compound Ltd Zalon division
42	€1,269.00	€53,298	Compound Ltd –Zalon divison
	€4,444.00	€319,998	
84	€3,300.00	€277,200	Byron Ltd
84		€42,798	Savings from order of 84 batches

Considering computations only

Deetron division would order 42 batches from outside as the quantity discounts from ordering 84 batches are insufficient to increase that savings..

[4 marks] for similar workings

Question 1 (c) continued
Other issues

[1] Franchise arrangements.
   This might be seen as accepting Bryon's right to infringe Compound's franchise
   territory and encourage it to sell to other customers in the Irish market.

[2] Threat to own markets.
    If the local market becomes aware of the lower prices for Zalon then such potential
   customers might switch their orders to Byron Ltd in Liverpool.

[3] Staff morale
   The affect on sales staff morale who are responsible for developing markets in Ireland
    and later elsewhere in Europe.

[4] Exposure to sterling
    It is not clear whether the quote is a translated rate from sterling to euro with a
    retaining obligation of paying in sterling. If this is the case then exposure to exchange
    rate fluctuations arise. Further it does not mention whether delivery costs are included.
    Even if such delivery costs are included, then from at what location is delivery
    completed? Ie. Dublin port ?or factory gate?.

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[5] Long term price or short term opportunity
   If Deeton division fulfils its budget target then it will need a regular order of 42 batches or
    more in the future. In that situation does the quoted price represents a long term or a
   "dumping price" arising from temporary spare capacity in Byron Ltd.

 Any four of the above or similar   [5 marks]

Question 2

Batch	Time	V.C. €21.75	Batch €1,000.00	Delivery cost €256.00	Total 73.00%	Sale Price	Average Sales price	13.00	
1st	100.00	€2,175	€1,000.00	€256.00	€3,431	€4,700.00	€4,700.00		
first two	160.00	€3,480	€2,000.00	€512.00	€5,992	€8,208.22	€4,104.11	3.00	(a)
2nd	60.00	€1,305	€1,000.00	€256.00	€2,561	€3,508.22	€3,508.22	3.00	(b)
15 batches	627.30								
16 batches	655.36								
16th batch	28.06								
20th cust	28.06	€610	€1,000.00	€256.00	€1,866	€2,556.62	€2,556.62	3.00	(c)
first twenty	767.60	€16,695	€20,000.00	€5,120.00	€41,815	€57,281.38	€2,864.07	4.00	(d)

(c) The time taken to make the 20th batch is the time taken to make the 16th batch

(d) The time taken to make the first twenty batches is the time taken to make the first 16 batches i.e. 655.36 plus time for 112.24 hours for 4 batches [4] x 28.06 or

(e) Both labour and labour related costs –variable production overheads- amount to approximately 54% of the total costs. They are thus significant in terms of overall costs. Additionally unlike many start-up companies where there is no historical data, Compounds Ltd has access to such data from the production of the same product in Tex Ltd.
It would be important however to ensure that comparison with the work processes in Tex Ltd are not distorted by differing labour and health & safety regulations on statutory breaks and similar practices. Further levels of educational attainment between the two workforces may be dissimilar. It presumes also that there are no undue intervals between production processes so that re-learning rather than speedier repeat practice takes place.

Subject to the above it is relevant in that it forecasts a drop in total costs for a batch of Zalon from €3,431 for the 1st batch to €1,866.00 for the 16th batch which is a reduction of 46%.Consequently this would revised the initial sales price of €4,700 to €2,556.62 an amount that is below the quoted price of Byron Ltd.
Further as this is a start up company the learning curve is also useful in establishing realistic standards against which to assess performance and determine the amount of a bonus to divisional managers.

Or similar comment   [7 marks]

Qn 3 **Deetron Cash flow**		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	20.00
months credit	(i)	€60,000	€204,000	€252,000	€276,000	€792,000	2.00
Delivery costs	(ii)	(€5,850)	(€8,190)	(€8,190)	(€10,530)	(€32,760)	2.00
Payments for chemical Z	(iii)	(€33,600)	(€30,800)	(€28,000)	(€25,200)	(€117,600)	4.50
Zalon payments for				(€47,250)	(€70,875)	(€118,125)	2.00
Variable overheads paid:							
immediately		(€15,582)	(€15,582)	(€15,582)	(€15,582)	(€62,328)	2.00
1 month later		(€41,552)	(€62,328)	(€62,328)	(€62,328)	(€228,536)	2.00
Fixed Overheads		(€500)	(€500)	(€500)	(€500)	(€2,000)	2.50
€42k/4 minus€10k dep.							
Operating cash flow		(€37,084)	€86,600	€90,150	€90,985	€230,651	
							1.00
Machine		(€600,000)				(€600,000)	
		(€637,084)	€86,600	€90,150	€90,985	(€369,349)	
Allocation/opening bal.		€350,000	(€287,084)	(€200,484)	(€110,334)	€350,000	1.00
Closing balance		(€287,084)	(€200,484)	(€110,334)	(€19,349)	(€19,349)	1.00

Determine production and purchases		Jan-March	April-June	July-Sept	Oct-Dec
		Quarter 1	Quarter 2	Quarter 3	Quarter 4
Budgeted Sales in batches		15	21	21	27
Opening inventory of finished batches		0	6	6	6
Budget closing inventory of finished batches		6	6	6	0
Thus Production batches required		21	21	21	21
		x 500 litres	x 500 litres	x 500 litres	x 500 litres
		equals	equals	equals	equals
Chemical Z production requirements		10,500 u	10,500 u	10,500 u	10,500 u
Opening inventory of Z in litres		0	2,100	2,100	2,100
Budgeted closing inventory of Z in litres		2,100	2,100	2,100	0
Purchase requirements of chemical Z		12,600 u	10,500 u	10,500 u	8,400 u
Purchases in money terms [€4 per litre]		€50,400	€42,000	€42,000	€33,600

Budgeted purchases of Zalon in batches		21	21	21	21

Question 3 –Deetron cash flowsolution continued

(i) Determination of cash received from sales on credit

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Sales	€180,000	€252,000	€252,000	€324,000	€1,008,000
months credit	€60,000	€204,000	€252,000	€276,000	€792,000

One 1/3rd of the sales of quarter 1 will be received in quarter 1
Quarter 2 2/3rd of the quarter 1 sales will be received in quarter 2 and 1/3rd of
quarter 2 will be received in that quarter

(ii)   **Delivery costs**; These are the sales batches of the quarter multiplied by €390
Example quarter one is 15 batches x €390 equals €5,850

(iii)   Purchases –Chemical Z
Suppliers will give one months credit thus 2/3rd of quarter 1 will be paid in quarter
i.e.€50,400 x 2/3rd equals €33,597 =€33,600
In quarter 2 payments amounting to 1/3rd of quarter 1 and 2/3rd of quarter 2

(iv)   **Zalon** This is purchased from other division for the first two quarters thus no cash
flow involved. It may be however that a cash transfer may be made between the
two divisions' bank accounts But since measurement of profit is not affected it
would not be argued by the divisionalheads.
The outside supplier-Byron Ltd will give one months credit and thus similar
computations to chemical X. i.e 2/3rd in a quarter and 1/3rd from previous quarter.
(v) Variable Overheads

	Jan-March	April-June	July-Sept	Oct-Dec
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Budgeted Sales in batches	15	21	21	27
Opening inventory of finished batches	0	6	6	6
Budget closing inventory of batches	6	6	6	0
Production batches	21	21	21	21
	x €3,710	x €3,710	x €3,710	x €3,710
Chemical Z	equals	equals	equals	equals
Variable o/h	€77,910	€77,910	€77,910	€77,910

Immediately 20%	(€15,582)	(€15,582)	(€15,582)	(€15,582)
1 month later 80% [2/3rd current 1/3rd prior]	(€41,552)	(€62,328)	(€62,328)	(€62,328)

Question 4 solution

	Actual		**Budget**	
Sales Volumes	12,000 units		14,000 units	
Selling price unit	€140.00		€145.00	
Production volumes	13,000 units		14,000 units	
Direct materials X	130,000	kilograms	126,000	kilograms
price per kilogram	€1.10	per kilogram	€1.25	per kilogram
Direct Materials Y	65,000	kilograms	84,000	kilograms
price per kilogram	€6.00	per kilogram	€5.00	per kilogram
Total Labour hours	52,000	hours	70,000	hours
Rate per labour hour	€6.00	per hour	€5.00	per hour
Fixed Production overhead	€680,000		€700,000	
National Market	45,000units		56,000 units	

Preliminary computation
Standard net profit computed as

Sales price		€145.00
D.Materials X	[126,000 kg/14,000u] x €1.25 = €11.25	
D.Mateirals Y	[84,000 kg/14,000u] x €5.00 = €30.00	
		€ 41.25
Labour	[70,000 hours/14,000u] x €5.00	€ 25.00
Fixed production overhead [€700,000/14,000u]		€ 50.00
Total production costs		€116.25
Standard net profit		€28.75

Thus budgeted net profit is 14,000 units x €28.75 equals €402,500

Question 4 continued

Sales price variance
[Actual sales price minus standard sale price] x actual units sold

| €140.00 | minus €145 |] 12,000 units | (€60,000) A | 1.00 |

Material price variance
[Std Material price minus Actual Material price] x actual inputs

Direct Material X
[€1.25 minus €1.10] x 130,000 kilograms equals   €19,500 F   1.00

Direct material Y
[€5.00 minus €6.00] x 65,000 kilograms equals   (€65,000) A   1.00
                                                           (€45,500) A

Material Usage
[Std inputs for actual output minus actual input] x std price

Direct material X
[13,000u x 9kg=117,000kg minus 130,000] x €1.25 =   (€16,250)A   1.00

Direct Material Y
[13,000 units X 6kg =78,000 kg minus 65,000] x€5.00= €65,000 F   1.00
                                                  €48,750

Labour wage rate variance
[Std wage rate minus actual wage rate] x actual hours

| [€5.00 minus €6.00 |] x 52,000 hours= | (€52,000)A | 1.00 |

Labour efficiency variance
[Std input for actual output minus Actual hours] x std wage rate

[13,000 units x 5=65,000 hours-52,000 hours] x €5   €65,000 F   2.00
                                                €13,000 F

Fixed o/h expenditure
[Budgeted minus actual] i.e. €700,000 minus €680,000   €20,000 F   1.00

Fixed volume variance
[Actual units minus budgeted units] x Fixed overhead rate

[13,000 units minus 14,000 units] x €50   (€50,000) A   2.00
Subtotal to next page   (€73,750)   12.00

Question 4
Brought forward from previous page sub total of variances   (€73,750) 12.00

Market size
[Actual market minus budgeted market] x std % x std net profit

[45,000 units minus 56,000 units] x 25% x €28.75 equals   (€79,063) A 2.00

Market share
[Actual units minus actual market x std %] x std net profit

[12,000 minus 11,250 i.e.45,000 x 25%] x€28.75 equals   €21,563 F 2.00
                                                                                                                        (€131,250)

Budget Net profit 14,000 units x std net profit €28.75 equals   €402,500
                                                                                                                        _____
Actual net profit   €271,250

    (x)
    <u>Actual net profit</u>
    Sales   12,000u x €140 equals   €1,680,000

    Direct Materials X   130,000 kg x €1.10 =€143,000
    Direct materials Y   65,000 kg x€6.00 = €390,000
                                                                                                                        (€533,000)

    Direct Labour 52,000 hours x €6   (€312,000)

    Fixed Costs   (€680,000)
    Plus closing inventory 1,000 x €116.25   €116,250
    Actual net profit   €271,250
                                                                                                                        [4marks]

Question 5(b)

					15.00
€24,000	Report		€0	comitted cost	1.00
€20,000,000	Cost of ship		€0	sunk cost	1.00
€18,000,000	Insurance	(€18,000,000)		insurance proceeds foregone	1.00
€2,100,000	Goods	€2,100,000		saving by recovered goods	1.00
	Goods	(€2,100,000)		insurance proceeds foregone	0.50
€21,000,000	Replacement ship	€21,000,000		avoids cost	0.50
			€3,000,000	savings	
					1.00
€2,100,000	Salvage company		(€2,100,000)	costs	
€600	per Wk for Fred	€5,400	€0	being paid anyway	1.00
€620	per Wk for Jill	€5,580	€0	being paid anyway	1.00
	Contract				
€100,000	contract price	€100,000		opportunity cost	1.00
(€48,000)	Variable costs	(€48,000)		opportunity saving	1.00
(€10,000)	D.Cost already spent	€0		Sunk	1.00
(€15,000)	allocated costs	€0		irrelevant	1.00
			(€52,000)	costs	
€500	per wk for 2 receptionist	€3,000	€0	queries regardless of salvage or not	
€325,000	environmental cost		€325,000	savings	1.00
€18,000	new seaworthy certificate	(€18,000)			1.00
	Seaworthy certificate	€5,000			1.00
			(€13,000)	costs	
			€1,160,000	savings	

On the basis of the computations recommend salvage goes ahead. However there may be other costs omitted such as refitting the raised ship etc.

Question 5-continued

(a)

      (i)   Relevant cost
      (ii)   Sunk costs
      (iii)   Opportunity cost
      (iv)   Incremental cost

(i) Relevant cost. Any costs which is changed by a decision.

(ii) Sunk costs are irrelevant for decision making.

(iii) Opportunity costs : This is net income foregone by choosing option A instead of option B.

(iv) Incremental cost: At given level of activity the increase in total costs brought about by the production of more than one extra unit.

Question 6

(a) Explain, in the context of transfer pricing, what is meant by sub-optimal decisions. **[4 marks]**

(b) Set out and describe three advantages and three disadvantages of a "market based" approach to transfer pricing. **[12 marks]**

(c) Set and describe two situation where a "cost based" approach to transfer pricing might be appropriate. **[4 marks]**

Sub optimal decision

Sub-optimal decision making arises when division A wishes to sell a unit of good to division B for a transfer price of €X but division B can purchase that unit of good on the outside market for €x-1 and does because it is cheaper.

However if the company wide cost, ie. ignoring the divisional structure, is €x-2, then the company profit will not be optimised because it will have paid a higher cost for the unit then the cost of making it itself.

Question 6

Three advantages of market based transfer price

(i) Divisional autonomy

It can enable the selling division to operate as a profit centre and be conscious of the need to maintain cost efficiencies in order obtain a targeted return on the capital employed. Equally the Buying division can reference the transfer price, adjusted for savings such as delivery costs, to alternative outside prices.

(ii) Corporate full profit maximisation

If the transfer price is market based, then the buying division is unlikely to go outside to the market to source a stranger supplier. Additionally it can be easier for the supplier division to integrate the supply times with the required times of the buying divisions thereby contributing to the minimisation of stock holding costs. Certain duplications can be avoided such as two purchasing departments, and the pooling of administration and other costs so that the overall unit costs, company-wide, are reduced thereby contributing to increased profits company wide.

(iii) Divisional performance

Many large divisions of companies, can be found in single stand-alone companies engaging in the same activities to provide the same goods/services. For that reason with a market based transfer price it is easier to bench mark the performance of a division against similar stand-alone outside suppliers. This can enable to board to decide whether it might be more profitable to close a division and source the same good/service from an outside supplier. Additionally it enables the board to assess individual divisional manager's performance in obtaining adequate return on capital employed, and to identify future high fliers for promotion to the board.

Disadvantages

(i) Market price-short term, long term, distressed
The market price may temporary due to dumping or strikes in rival suppliers that temporarily create artificial shortages.

(ii) Absence of a market price for an intermediate product
Some products or services are customised for a particular buyer or there may be no practical method of determining a market price in the absence of an active market.

Question 6 continued

(iii)   <u>Failure to exploit spare capacity where willing buying division but at lower than market price</u>

The variable costs [excluding delivery costs where relevant] plus the opportunity costs [contribution from market sacrificed] is the minimum transfer price on a company wide basis.

This is where a supplying division has spare capacity and there is an opportunity to sell for a price that is more than the minimum cost but less than the transfer price but that division will not do so. In that situation the transfer price has acted as a barrier to exploiting all the capacity of the division.

Two situations where the cost based approach to transfer pricing might be appropriate

(i) There is no external market for the good/service nor any practical mechanism of determining a market value for those goods.

(ii) There is a market but there is only limited demand or that the price fluctuates widely due to random dumping by suppliers.