Institute of Incorporated Public Accountants

Module 13:

Advanced Management Accounting
August 2012

Instructions: **Answer five questions**

You must answer the three questions in Section A

Answer any two questions from Section B

All questions carry equal marks

Time Allowed: 3 Hours

Section A-Compulsory Answer all questions

Question 1

(a) Ignoring any learning curve affect, calculate the optimal selling price and quantity that will maximise contribution. Show by how much the profit computed under the "Optimal selling price" approach is greater or less than the profit computed under Mary's suggestion that the company sell the maximum of 8,000 machines at €230 each.

[14 marks]

At a given quantity Q the sale price will be;

Sale price at zero minus Quantity x <u>Sale change</u>
<div style="text-align:right">Quantity change</div>

<u>Sales price at zero</u> :

For every €20 increase in price the demand for machine will fall by 2,000 units assuming a linear relationship.

At 8,000 machine sales at SP of €230 this means an increase of sale price by €80 i.e.[[8,000u/2,000u) x €20] will lead to zero units sold at a price of €310 [€230 + €80]

SP €310 minus Q x <u>€20</u>   equals   €310 minus .01Q
<div style="text-align:center">€2,000</div>

Total Sales revenue equals Total Quantity or Q x Sales price as above

equals €310 Q minus .01Q^2 equals total revenue

At optimum profit Marginal Revenue equals Marginal Cost

Differentiating the sales revenue function with respect to quantity equals   310 minus .02 Q

1

Marginal cost ignoring learning curve effect is €145 per question.

MR 310 minus .02 Q equals M.C €145

Thus .02 Q equals 310 minus 145

Thus Q equals 165 divided by .02 equals 8,250 machine

Sales price is thus €310 minus €8250 x .01 equals =€227.50

	Optimal Price	**Director Mary**
Units	8,250	8,000
Sales price per unit	€227.50	€230.00
Variable costs	(€145.00)	(€145.00)
Contribution per unit	€ 82.50	€ 85.00
Total contribution	€680,625	€680,000

The difference is insignificant and will greatly depend on whether a linear relationship exists and the degree of accuracy of price volume relationship.

(b)   Comment on the proposal in general with particular reference to amounts presented and any other factors that should have been considered in the presentation.

[6 marks]

Any six points i.e. 6 x 1 mark from below

(i)   There is no mention of patent taken out

(ii)   There appears to be no inclusion of marketing costs

(iii)   It is not clear if sales prices include or exclude VAT

(iv)   There IS no mention of working capital in terms of credit that will be given to the shops and stock levels

(v)   No mention is made of the mark-up to be earned by shops and what they can expect to sell it for to customers and in what quantities. Ultimately the sales of the product is a derived demand by the public from the shops.

(vi)   Interest costs of capital tied up in the investment are ignored

(vii)   No mention of the timeframe of the demand on a month by month basis and affect on cash flow requirements.

(viii)   No mention of a possible competitor or rival product

(ix)   No mention of the expected market life of the product in what is an evolving technology market

(x)   Variable overheads such as light &heat appear to be excluded

(xi)   There is no mention of delivery costs unless shops are expected to come and collect.

(xii)   No bulk discount mention for buying materials

Question 2

(a)   Compute the rate of learning that applies to production and calculate the length of time that each machine will take once the learning effect ceases after production of the 4th machine.

(i) Cumulative Units produced	(ii) Cum.Prod.hrs	equals (ii) divided by(i) Cumulative average
1 machine	2.00 hours	2.00 hrs
Change in cumulative average per unit------------→		90%
2 machines	3.60 hours	1.80 hrs
Change in cumulative average per unit-------------→		90%
4 machines	6.48 hours	1.62 hrs

Cum Avg. time falls by 90% from cum 1 machine to   two machines

Cum.Avg time falls by 90% from cum 2 machines to four machines

Average cumulative time per machine for three machines

Y equals A X^N

Where A is the time for the first unit

Where X is the quantity

Where N is learning rate of 90% or

$$\frac{Log\ .90}{Log\ 2} = \frac{(0..04575749)}{0.30102995} = (0.152) \text{ or per Qn table}$$

3

Y equals A x X^n = 2 x $3^{(0..152)}$ equals 2 x ..846208862=1.6924177

Total hours for three machines is 1.6924177 x 3 machines = 5.08

Total hours for four machines is per above   6.48 Thus

hours for the 4th machine and thereafter is   1.40

Allowing for rounding answers should in about above

[10 marks]

(b)   Taking account of the learning curve effect re-compute the optimal sales price and quantity that will maximise contribution.

The labour costs per machine will be reduced so that revised variable costs are

Materials unchanged as before	€ 85.00
Labour costs 1.40 hours x €30 equals	€ 42.00
Total revised variable costs	€127.00

Thus restating formula as Question 1

MR 310 minus .02 Q equals M.C €127.00 [instead of €145]

0.02 Q equals 183.00

Q   equals 9,150 machines

Sales price is thus €310 minus 9,150 x .01 equals €218.50

[5 marks]

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(c)   Calculate the break even in machines and the margin of safety in percentage terms incorporating the effects of the learning curve and the recomputed optimum selling price.

<div align="right">[5 marks]</div>

Sales price   €218.50
Variable costs   (€127.50)
Recomputed contribution per unit € 91.00

Break even   Total Fixed Cost €455,000 =5,000 machines
                    C/per unit   €91

Margin safety   Actual proposed Q minus B/Even Q X 100
                    Actual proposed Q

                    9,150 minus 8,000 x 100 equals 12.56%
                         9,150

Question 3

(a)   Explain what is meant by meant by Target Costing outlining the four stages involved and briefly explaining each.

Target costing

This is the reverse of Cost Plus pricing. In cost plus price the costs are first computed and then a margin is added to determine the selling price.

Where an entity has monopoly this might be an acceptable approach.

In target costing the selling price is determined first and then set a target margin the cost is derived from this. This might be the approach for a company in a highly competitive market where it does not have monopoly

Stage 1

Determine the target price which customers will be prepared to pay for the machine.

This requires the company to be able to differentiate its product from others and to communicate the value in terms of an acceptable selling price.

Stage 2

Deduct the target profit margin from the target price to determine the target cost.

Factors input in determining margin here are the cost of capital which can be weighted average cost of equity and long term funds.

Stage 3

Estimate the actual cost of the product

In addition to determining direct production costs it is also (i) Variable overhead rates

(ii)   Indirect overhead rates. In that regard it is necessary to estimate levels of activity in order to compute a predetermined overhead in relation to indirect costs

Stage 4

If the estimated actual costs exceed the target cost then investigate ways of reducing it

A information system that compares actual to estimated costs is necessary in order to control variations of significant amount.

(b)   As the newly appointed Accounted set out and explain any three requirements necessary for the proper implementation of a target costing system in the company.

Sales Price/Revenues

A phone survey may not be the best approach to establishing sales price. Information in relation to firm orders and agreed prices should be established including discount policies, credit terms and warranties.

Further VAT may or may not have been understood to be already included in any quote supplied to the Hardware shops and/or delivery costs.

Any system should have some basic statistical packages for assessing information on prices, customers, and sales volume size of the potential market.

Costs

The establishment of cost centres and assignment of both direct and indirect costs to those centres and assignment of responsibility over same . This is necessary for reporting purposes and assigning responsibility for correction any variations between actual and estimated.

Reporting information systems

Robust accounting information systems that will integrate both statutory reporting requirements with management decision making systems that can produce both budgeted and actual results..

Question 4

	Actual		Budget	
Sales Volumes	11,000 u		10,000 u	
Selling price unit	€8.00		€10.00	

				kilogram
Production volumes	11,000 u		10,000 u	
Total Direct materials	5,000	kilograms	4,000	s
price per kilogram	€6.00		€8..00	
Total labour hours	7,000	hours	6,000	hours
Rate per hour	€4.20	per hour	€3.00	per hour
Fixed Production overhead	€13,000		€12,500	
Market size	30,000 u		25,000 u	

Actual profit

€88,000 sales minus€30,000 materials minus €29,400 labour minus
Fixed Production overhead €13,000 equals €15,600

Budget profit

€100,000 sales minus €32,000 materials minus €18,000 labour minus
fixed costs of €12,500 equals €37,500

Sales price

[A.S.P. minus Std SP] x Actual Sales units

[€8.00 minus €10] x 11,000 equals €22,000 A

Sales Volume

[Actual Sale volume minus Budget Sales volume] x Std Contribution

[11,000   minus 10,000] x €5.00* equals €5,000 F

Contribution €10 minus [€8.00x 0.40 plus €3.00 x 0.60]=€5.00

Question 4
Material Price

[Std Price minus Actual Price] x Actual Usage

[€8.00 minus €6.00] x 5,000kg   equals €10,000 F

Usage

[Std Input required

[for actual output   minus Actual input] x Std Price

[11,000u x(4,000kg/10,000u) minus 5,000] x €8 equals €4,800 A

Labour rate variance

[Std Wage rate minus Act. Wage rate] x Actual hours

[€3.00 minus €4.20] x 7,000 hours   equals €8,400 A

Labour usage

[Std input hours required

[for actual output   minus actual hours] x Std Wage rate

[11,000 x (6,000hrs/10,000u) minus 7,000kg] x €3.00 =   €1,200 A

Analyses of Sale volume
Market size
[Actual minus Budgeted] x Std share x Std Contribution

[30,000u minus 25,000u] x40% x €5 equals   €10,000 F

Market share
[Actual units minus Std size of actual market] x Std Cont.

[11,000u minus (30,000u x 40%) x €5.00 equals   €5,000 A

Total sales volume   €5,000F

Comments on production director and sales director views
Any reasonable comments accepted

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Question 5

		TAC	M.C.

Sales 5,000 €15.00 €75,000 €75,000

			TAC	M.C.
Opening Inventory	0			
TVC	5,300	€10.00	€53,000	€53,000
F.Costs		€1.50	€7,950	N/A
	300	€10.00	(€3,000)	(€3,000)
		€1.50	(€450)	N/A
Cost of goods sold			€57,500	€50,000
Budgeted Fixed Costs				€8,250
under absorbed	200 u	€1.50	€300	N/A
Expenditure variance			€950	€950

€58,750   €59,200

		TAC	M.C.
Net Profit		€16,250 €450	€15,800
less sales cost		(€5,000)	(€5,000)

€11,250   €10,800   Question 5 solution-continued

Sales   5,800 €15.00   €87,000   €87,000

			TAC	M.C.
Opening Inventory	300	€10.00	€3,000	€3,000
		€1.50	€450	N/A
TVC	5,700	€10.00	€57,000	€57,000

F.Costs		€1.50	€8,550	N/A
Closing stock	200	€10.00	(€2,000)	(€2,000)
		€1.50	(€300)	N/A
Cost of goods sold			€66,700	€58,000
Budgeted Fixed Cost			N/A	€8,250
Overabsorbion	(200)	€1.50	(€300)	N/A
Expenditure variance			(€250)	(€250)
Total costs		€66,150	€66,000	
Net Profit			€20,850 (€150)	€21,000
less sales costs			(€5,800)	(€5,800)
€15,050	€15,200			

Or alternatively TAC side by side and MC side by side

Along the following lines

Advantage of TAC

    (I)   Complies with IAS (II) Recognises all costs including fixed are necessary (iii(Does not create fictitious losses by writing off fixed production costs which may be perfectly recoverable

    (II)   Advantage of M.C.

            By ignoring unavoidable costs such fixed production costs it is more decision making orientated

            It is profit is not influence by movements in stock
It avoids any unrecoverable production fixed costs being capitalised

Question 6

  (a)   The setting of a transfer price between two division can lead to dysfunctional decision making.

      (i)   Explain what is meant by dysfunctional decision making.

(ii)   Outline four method of computing a transfer price.

(iii)   Explain in the case of two of the methods how dysfunctional decision making can occur

(14 marks)

Dysfunctional decision making is where two divisional manager seeking to maximise division returns do so at the expense of the company optimising its profits. For example if division A has spare capacity so that the units it produces could be transferred as raw materials to Division B at a marginal cost of say €10 but the division A manager insist on a transfer price of say €11.50. As a consequence if Division B manager goes to the market to buy them at say €11 thereby saving €.50 per unit but the company overall pays €1.00 more than necessary then there is a sub-optimisation of the overall company's profits

Method of transfer are

	Actual		Standard
Variable Cost	Y		Y Total
Cost	Y	Y	
Variable cost plus mark-up	Y		Y Total
Cost plus mark-up	Y		Y
Market price	N/A	N/A	
Negotiated			
Imposed by Head office			

Delegation Reward, autonomy, de-motivation references to these in relation to the above

Life cycle page 589 Drury costing or similar content

(b)   Explain the concept of the life cycle costing and how it is useful in product costing

(6 marks)

(20 marks