Institute of Incorporated Public Accountants

Module 13:

Advanced Management Accounting
SOLUTIONS
2013

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 three questions

			€	Totals
Budgeted Sales / Revenue	20,000 u	scanners x S.P. €115	€	**2,300,000**
Budgeted Direct materials A	200,000	kilograms x €1.00 per kg	€	200,000
Budgeted Direct Materials B	200,000	Kilograms x €5.00 per kg	€	1,000,000
Budgeted Direct Labour	100,000	hours x €3.00 per hour	€	300,000
Total budgeted Variable costs			€	**1,500,000**
plus				
Budgeted total Fixed Costs				
Production			€	400,000
Marketing			€	20,000
Budgeted Total Costs			€	**1,920,000**
Budgeted Net Profit			€	**380,000**

Question 1

Based on the original projected amounts

(a) Compute the break-even in units and revenues
[rounded to the nearest whole number]   (4 marks)

  TFC €400,000 +€20,000 =10,500 units or €1,207,500 sales
         C/unit   €40

(b) Compute the margin of safety in percentage terms
[rounded to two decimal places]   (2 marks)

  Actual sales units -Break even units 20,000-10,500u =47.50%
         Actual Sales units   20,000u

**(c) Ignoring the Operations director's objections should the
      sales director's proposal of a cut in sales price for an
      increase in volume have been accepted ? Give reasons**   (4 marks)

  Revised Contribution per unit €40 minus €3= €37.
  Revised total contribution 22,000u x €37 equals €814,000
  Less fixed costs unchanged   (€420,000)
  Revised net profit   €394,000
  Existing profit   €380,000
  Thus on basis of computation increase of   € 14,000

**(d)   Compute the revised break even in units under the rejected
  sales director's proposal to amend Sales Price to €112.00**
  [rounded to the nearest whole number]   (2 marks)

  Revised break even €420,000 equals 11,351u
                         €37

(e)   List four assumptions underlying break even computations (4 marks)
  (i)   Cost are divisible between fixed and variable
  (ii)   Fixed costs remain unchanged in total within relevant range
  (iii)   Production units equals units sold
  (iv)   Variable costs change in total but remain constant per unit within
           the relevant range
  (v)   Where there is more than one product they are produced and
           sold in fixed proportions
  (vi)   Sale price remains constant per unit within the relevant range.

(f)   Suggest four other factors for consideration
  [The following plus acceptable alternatives   (4 marks)

  (i) Reaction of competitors to existing sales price. Will they cut theirs?
      Mount an aggressive attack marketing campaign?

  (ii) As this is a new product there may be a learning curve which means
       that future labour hours per unit in terms of efficiency may actually be
       lower thus lowering labour costs per unit

   (iii) Are warranties being offered in relation to the sold scanners.
        Has an estimate of these been included costs?

  (iv) What will be the affect on working capital of the new product in
       relation to receivables and payables.

  (v) Is the sales price inclusive or exclusive of VAT? If inclusive then above
      amounts for break even need to recomputed with ex VAT Sales price

  (vi) The incremental increase taxation on profits needs to be computed.

  (vii) Do the fixed production costs include an appropriate write off of any
        development cost previously capitalised in relation to the scanner.

                                                          (20 marks

Section A - Compulsory   Answer all three questions
A summary of actual results for the year ended 30/04/13 are set out below

Actual Sales	21,000 u	scanners x €111.50	€	2,341,500
Actual direct materials A	199,500	kilograms x €1.10 per kg	€	219,450
Actual direct Materials B	224,700	kilograms x €4.50 per kg	€	1,011,150
Actual Direct Labour	115,500	hours x €2.85 per hour	€	329,175
Total Variables costs			€	**1,559,775**
plus				
Actual Fixed Costs				
Actual Production costs			€	420,000
Marketing			€	25,000
Actual Total costs			€	**2,004,775**
Actual total Net Profit			€	**336,725**

Question 2
Compute following variances

(a) **Sales price variance**   (2 marks)
   [ASP €111.50 minus Std S.Price €115] x21,000u   equals (€73,500) A

(b) **Sales volume variance expressed in standard contribution analysed into**
                  (i)   Market size   (2 marks)
   [Actual market - Budgeted Market] x std % x std contribution

   [86,000 u -80,000 u] x 25% x €40 equals   €60,000 F

                  (ii)   Market share   (2 marks)
   [Actual sold - std share for actual market] x standard contribution
   [21,000 u - 25% x 86,000u] x €40   (€20,000) A

   Proof not asked for

Volume variance
 [Act. units 21,000u-Budget 20,000u] x €40 equals €40,000 F

(c) **Material price variance [for both direct material A and B**] (4 marks)
  [Std price A €1.00- Act price A €1.10] x AU 199,500=(€ 19,950) A
  [Std price B €5.00- Act Price B €4.50] x AU 224,700= €112,350 F
  Total materials price variance   € 92,400 F

(d) For direct materials A and B compute the
                                (i)   **the mix variance**   (2 marks)
  [Act Mat. A in std mix 424,200kg x 50%-199,500kg] x €1.00=   €12,600 F
  [Act Mat B in std mix 424,200kg x 50%-224,700 kg] x€5.00= (€63,000)A
                                        Total Mix variance   (€50,400)
    A

                                (ii)   **the yield variance**   (2 marks)
 [Std Mat A rqd for actual output -Actual in std mix] x Std price
   [21,000 u x 10kgA minus 424,200 x 50%] x €1.00 equals   (€2,100) A
   [21,000 u x 10kgB minus 424,200 x 50%] x€5.00 equals   (10,500) A
                                        Total Yield variance(€12,600)A

(e) **Labour rate and the labour efficiency variance**   (4 marks)
  Labour rate [Bud rate - Actual rate] x actual hours
            [€3.00 -€2.85] x 115,500 hours equals €17,325 F
  Labour efficiency
            [Time allowed for output -Actual hours] x Std Wage rate
            [21,000u x5hrs -115,500] x €3 equals (€31,500) A

(f)   **Fixed expenditure variances** [(i) Production and (ii) Marketing](2 marks)
   Production Budget €400,000 minus Actual €420,000 equals (€20,000) A
   Marketing   budget €20,000 minus Actual €25,000   equals (€5,000) A
                                                (20 marks)

**Summary showing comparisons with actual and Budget and variances.
This detailed summary was not asked for**

		Original Budget	Flexi Budget	Actual results	Variance	
	1 U	20,000 U	21,000U	21,000U		
Sales/Revenue	€115.00	€2,300,000	€2,415,000	€2,341,500	(€73,500)	A
Production Units		20,000U	21,000U	21,000U		
Direct Material A	€10.00	€200,000	€210,000	€219,450	(€9,450)	A
Direct Material B	€50.00	€1,000,000	€1,050,000	€1,011,150	€38,850	F
Direct Labour	€15.00	€300,000	€315,000	€329,175	(€14,175)	A
Contribution	€40.00	€800,000	€840,000	€781,725	(€58,275)	
less						
Fixed Overhead production	€20.00	€400,000	(a)€400,000	€420,000	(€20,000)	A
Net profit before Marketing	€20.00	**€400,000**	**€440,000**	**€361,725**	(€78,275)	
less						
Fixed Marketing costs		€20,000	(a)€20,000	€25,000	(€5,000)	A
Net Profit	**€0.00**	**€380,000**	**€420,000**	**€336,725**	**(€83,275)**	

(a)   Budgeted Fixed costs do NOT "flex" with flexi budgets

(b)   A flexi budget is simply a restated budget taking account of actual units of output x standard input amounts.
Since the actual volume21,000 units is 5% greater than budgeted volume 20,000 units therefore the flexed contribution [€840,000 [i.e. sales minus Variable costs] is 5% greater than the original budgeted contribution of €800,000

Question 3

(a) **Using the computations determined in answer to question 2**
   set out a statement reconciling the budgeted net profit
   with the actual net profit   (8 marks)

Budgeted Net Profit		€380,000	[0.50]
Sales volume variance			
Market size	€60,000 F		
Market share	(€20,000) A		
		€40,000 A	[1.50]
Flexed budget based on 21,000 units		€420,000	[1.00]
Proof 21,000u x std contribution of €40			
Sales price variance		(€73,500) A	[1.00]
Materials variance			
Price	€92,400 F		
Mix	(€50,400) A		
Yield	(€12,600) A		
		€29,400 F	[1.50]
Labour variance			
Wage rate	€17,325 F		
Efficiency	(€31,500)A		
		(€14,175) A	[1.00]
Fixed overhead expenditure variance			
Production (€20,000) A + Marketing (€5,000)	(€25,000) A		[1.00]
		_____	
Actual Net Profit		€336,725	[0.50]

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(b)   **Write a report to the managing director incorporating the findings from your reconciliation statement and the comments made the directors at the meeting of 30ᵗʰ April 2012 and the 10ᵗʰ May 2013.**
 In it should be included an explanation of the different types of standards Ideal, basic and attainable and their relevance in relation to the report on the new product.   (12 marks)

To the M.D. Aerial Technologies Ltd
From J. Bloggs IIPA
Date x/y/z
Please find set out hereunder my report in relation to the performance of the new product Scanner incorporating the results of the variances computed and the comments made at the recent meeting.-

The following points might be included in any report though comments set out here are not exhaustive and there can be other equally acceptable approaches.

New product first budget, standards and learning curve
As this is a first budget for this new product, then there may be a learning curve in relation to developing attainable standards, as distinct from ideal, for inputs per unit of output as well as estimating the market share and market size.
In regard to standards a distinction has to be made between controllable and uncontrollable standards. Thus market size is not generally within the control of a company,
Further input prices may require to be analysed between controllable and non controllable such as general world wide rise in material costs..
In relation to the workers themselves there may exist a specific learning curve that can result in a fall in cumulative average labour hours per unit of output in future production periods.

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Flexing the budget
The original budget was based on 20,000 units with a standard contribution of €40 per unit to give total contribution of €800,000.
The budget needs to be restated or "flexed" for comparison with the actual production of 21,000 units.
The restated budgeted contribution for an actual volume of 21,000u is €840,000 [21,000u x €40]. The revised budgeted net profit €420,000 is after budgeted fixed costs of €420,000 which remain unchanged in a flexed budget.
As can be seen the actual net profit is approximately €83,275 less than this.

Volumes analysed into Market size and Market share
The market size favourable variance of €60,000 is attributed to an increase in the market from an estimated 80,000 units to 86,000 units an increase of some 7.50%. The overall increase in the market cannot be directly attributed to the business and is generally regarded as non controllable variance.

However Market size may be regarded to some extent as controllable through marketing strategies Thus offsetting the market size favourable variance has been a small drop in the company's market share from a projected 25% [20,000u/80,000u] to 24.40% [21,000u/86,000u].

This fall in market share is despite the fact that there was increase in marketing costs of 25% from €20,000 to €25,000.

The Sales director's proposed sales price amendment that was rejected
Further the original proposed cut the in selling price of €3.00 to €112.00, and which was rejected, has been overtaken by an actually greater reduction in selling price of €3.50. Despite that actual cut in selling price the sales volumes only increased by 1,000 units instead of the original estimated volume of 2,000 units. In that regard it would be helpful to review the methodology chosen for estimating sales volumes and prices.

Material Usage and Labour efficiency variances
In relation to material and labour both usage and efficiencies are adverse whilst their prices are favourable. The usage and efficiency could be inter-related in that labour learning errors might have led to material handling mistakes and the need for reworking.
Alternatively standards set might have been Ideal rather than Attainable.
Ideal standards assume the most efficient operating conditions under which minimum costs are incurred. Such standards can have demoralising affect on employees if they are not attainable ie. no allowance is made for spoilage, machine break down etc.

Price variances
Whilst the prices are favourable this may be due again to inappropriate standards or acquiring resources that are of a lesser quality than specified. For example the material acquired might be of a lesser standard than the amount specified or the employees recruited did not have requisite skills.

Conclusions and recommendations……………..
                                                    (20 marks)

Question 4 solutions

			20%	Total	€10.00	150%	€6,000
	Average	Sales	Profit	Cost	Wages	O/Head	Materials
Details for question>	€28,200	€28,200	€4,700	€23,500	€7,000	€10,500	€6,000
(a) Price 2nd caravan	€19,800	€19,800	€3,300	€16,500	€4,200	€6,300	€6,000
(a) 3 marks							
(b) 2 caravans same time	€24,000	€48,000	€8,000	€40,000	€11,200	€16,800	€12,000
(b) 4 marks							
(c) 3th & 4th caravans	€17,280	€34,560	€5,760	€28,800	€6,720	€10,080	€12,000
(c) 5 marks							
(d)(i) 1st order for 4 caravs	€20,640	€82,560	€13,760	€68,800	€17,920	€26,880	€24,000
4 marks							
(d(ii) 1st order for 6 [4 mark	€18,995	€113,972	€18,995	€94,977	€23,591	€35,386	€36,000

		Cumulative Average	Cum total	Individual caravans	
1		700.00	700.00		
2	80%	560.00	1120.00	420.00	second caravan
3		491.47	1474.42	354.42	3rd plus
4	80%	448.00	1792.00	317.58	Fourth caravan
5		416.95	2084.73		
6		393.18	2359.07		
7		374.14	2619.00		
8	80%	358.40	2867.20		

Every time cumulative output doubles the cumulative average time per unit is 80% of time taken for the output, in respect of which the current is double

Y equals AX^b`
Where A = hours for the 1st caravan, X = no number of caravans
b= learning curve which is 80% i.e. coefficient of -.32193

Using calculator for 3 caravans is $3^{-.3213}$ equals .70210
Thus X^b is .70210 x A which is 700 hours equals 491.47 cumulative average
Thus total hours for 3 caravans is 491.47 x 3=1474.42 hours and so on

Question 5

		Volume	total costs
		1,500 U	€950,000
change		500 u	€250,000
		2,000 U	€1,200,000

Thus the variable production costs are €250,000/500u equals €500
The TVC for 1,500u is 1500u x €500 equals €750,000.
Thus the total fixed costs are   €200,000

The selling costs are €80 per unit so total variable costs are €580

Sale Price per Unit			Sales
€ 1,200			1,000 U
€ 1,000			1,500 U
€ 800			2,000 U

Answer (a) (4 marks)

Sales price per unit	€1,200	0.50
Variable costs per unit	€ 580	0.50
Contribution per unit	€ 620	0.50

For 1,000 u total contribution is	€620,000	1.00
Less total fixed costs	(€200,000)	1.00
Net Profit for 1,000 units	**€420,000**	0.50

Question 5-continued

(b) (12 marks)
The volume is linear and changes by 500 units downward for every €200 increase in sales. Thus to go 1,000units to zero would require an increase in sales of €1,200 plus (1,000u/500u) x €200 equals €1,600

Sales price is €1,600 minus Q x €200/500u   (2 mark)

TR equals Sales price per unit x Quantity

equals   1600 Q minus 0.4 Q^2 (2 mark)

differentiating TR to obtain MR

$\underline{DtR}$ 1,600 minus 0.8 Q   (2 marks)
Dr Q

M.C. as already determined is €580

Optimum units is thus at MC = MR

€1600 minus 0.8 Q equals €580 [€500 +€80]

1,020 equals 0.8 Q

Q = 1275u   (2 marks)

Optimum price is 1,600 minus 1275 x 200/500

              1,600 minus 510

Optimum price   €1,090   (2 marks)

Sales price	€1,090
Variable costs as above	(€ 580)
Contribution	€ 510

Total contribution for 1,275u equals	€650,250	(2 marks)
Less fixed costs	(€200,000)	
Net Profit for 1,275 units	**€450,250**	

Question 5 ©

Criticisms-any two 2 x 2 marks

Difficulty in a firm, as distinct from an industry in estimating demand. Further, there can be inter-relationship with some of the firms other products that make it difficult to estimate demand at the product level.

Price is not the only influence on quantity.There can be quality, after sales service, credit terms, all of which will not be captured in a price model.

Marginal costs may in practice only be determined after considerable analysis and then may only be an estimate particularly where joint costs are involved. Thus the cost benefit in terms of personnel hours and incremental improvement in contribution may not in practice be determinable.

Question 6- Balance Score Card
A summary of points
 4 x 1 headings

FINANCIAL PERSPECTIVE   1 x 3 relevant pointss
Operating Profits , Return on Investment, Revenue Growth, Cost reduction ,
Asset utilisation various other measures including Key performance indicators.

CUSTOMER PERSPECTIVE 1 x 3 relevant points
Market share-market penetration
Customer retention-duration of relationship-repeat business, size of orders
Customer acquisition -number of new customers
Customer satisfaction-surveys, comments etc
Customer profitability - cost of acquiring, additional set relationship costs etc

Value proposition
  (i)   Product service-function, ease of use, price, design
  (ii)   Customer relationship- response time and time to delivery
  (iii)   Image and reputation- A Murphy car a mark of status, achievement?

Measures-Receiving a request and time to delivery
          Percentage of products with defects, or number of customer
           complaints, returns and exercise of warranties
           Price comparison with rivals and in eyes of customers

INTERNAL BUSINESS PERSPECTIVE -one x 3 relevant points
  (I)   Innovation- measures percentage of sales from new products, time to
           develop next generation of products, number of product leaders
           developed by company, cycle time from drawing board to delivery
  (II)   Operation processes-Cycle time measures example set up and down
           time periods, Quality measures such as yield, wastage, rework, returns
  (III)   Post service sales Measures such as repair and return times,
           collection of amounts owing from customers, etc

LEARNING AND GROWTH **1 x 3 relevant points**

(i)   Employee capabilities- Measures employee surveys on satisfaction, employee retention, productivity per employee, number of staff ideas in suggestion box.

(ii)   Information system capabilities - Processing time from recording of event to producing relevant reporting. Exception reporting capabilities, flexibility in incorporating external information

(iii)   Motivation, Empowerment and alignment- identification of personal goals with company goals, Goal congruence, Delegation, Rewards for targets achieved

Limitations

(i)   Many question the cause and effect relationship on the grounds that they are too ambiguous and lack a theoretical underpinning or empirical support

(ii)   The omission of an environmental perspective

(iii)   The omission of an employee perspective

(iv)   The danger of over cluttering were the above two be included

(v)   It might argued that it lacks predictability upon which decisions can be made