

MANAGEMENT ACCOUNTING

**December 2005
Certificate stage**

MARKING SCHEME



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Question 1

- (a) Capacity: 250 days x 25 children x 8 hours = 50,000 crèche hours
 Current year 80% capacity 50,000 x 80% = 40,000 crèche hours
 Next year 70% capacity 50,000 x 70% = 35,000 crèche hours 1

The current year's variable cost per unit is:

Variable costs		£	
	Agency staff		30,000
	Consumables/Provisions		<u>112,000</u>
			142,000

Crèche hours = 40,000

Variable cost per unit = $\frac{£142,000}{40,000} = £3.55$ 1

The current year's fixed cost is £167,600.

The next year's variable cost is £3.55 x 1.02 = £3.621 x 35,000 =	£	126,735	
Next year's fixed costs are £167,600 x 1.02 =		<u>170,952</u>	
Total cost		297,687	2

Allowing for the subsidy price that would need to be charged to recover the full costs next year:

		£	
Total costs	297,687		
Less subsidy	<u>165,000</u>		
	132,687		

Number of expected crèche hours = 35,000

Price per crèche hour = $£132,687/35,000 = £3.80$ 1

However, it has been stated that the maximum price that could be charged is $£3.25 \times 1.08 = £3.51$ per crèche hour.

The price of £3.80 will potentially reduce the demand further. If demand is 35,000 crèche hours, and the price charged is £3.51 per crèche hour, the total income will be £122,850 and costs will be £297,687. The net cost will be £174,837 (£5.00 per hour).

It can be concluded that the option to do nothing is not financially justifiable. 1

Marks will be awarded for all appropriate calculations (6)

- (b) 70% capacity represents 35,000 crèche hours. To fill capacity, an additional 15,000 hours would need to be generated from local residents.

The variable cost per crèche hour next year is £3.62

If the price charged is:

£3.50 - The variable cost is £3.62, so no contribution will be made per crèche hour. 1

£3.75 - This would give a contribution of £3.75 - £3.62 = £0.13 per crèche hour. In total £1,625 per annum. 1

£4.00 - This would give a contribution of £0.38 per crèche hour. In total £3,800 per annum. 1

£4.25 - This would give a contribution of £0.63 per crèche hour. In total £4,725 per annum. 1

None would contribute to fixed costs to any large extent. However, it could reduce the price that could be charged to the employees of the college.

If £4.25 per crèche hour were charged to non employees:

$$132,687 - 4,725 = £127,962$$

Price charged to cover costs would need to be $£127,962/35,000 = £3.66$

This is still above the maximum price sustainable. 2

Marks will be awarded for all appropriate calculations (6)

(c) Effect of closing the facility:

	£		
Variable costs saved	126,735		½
Other directly attributable costs saved	155,652	(170,952 – (15,000 x 1.02))	1
Costs of redundancy	(17,000)		½
Sale of excess equipment	16,000		½
Relevant saving			
In relation to common room	37,000	(45,000 – 8,000)	1
Income from employees	(122,850)	(3.51 x 35,000)	½
Net saving	195,537		½

Marks will be awarded for all appropriate calculations

After year 1 the savings each year will be £195,537 + £17,000 – £16,000 - £37,000 = £159,537. This accounts for the effect of non-recurring income and expenditure. ½

The best option is therefore to close the facility, if demand cannot be improved. 1

Non-financial factors:

- Effects of redundancy on staff morale within the college.
- Non-provision of service may have implications for the staff who have children at the crèche, if there is no longer a facility.

Marks will be awarded for relevant points to a maximum of 2 (8)

(20)

Question 2**(a) Standard Cost of the Techtron**

Materials	£		
Material X (9kg x £7)	63.00		
Material Y (3kg x £5.50)	16.50		
Additional parts (£74.00/100 x 46)	34.04		
Total materials	<u>113.54</u>		1
Labour			
Skilled £11.50 x 2.5	28.75		
Unskilled £5.00 x 1.5	7.50		1
Total labour	<u>36.25</u>		
Variable overhead			
4 hours x £3.75	15.00		½
Fixed overhead			
4 hours x £5.40	21.60		½
Standard product cost	<u>£186.39</u>		

Flexed Budgeted Profit and Loss Statement for the Techtron to 30 Nov 2005

Budgeted volume at Std Price (1,040 x 273)	283,920		½
Materials			
Material X (£63 x 1,040)	65,520		
Material Y (£16.50 x 1,040)	17,160		
Additional parts (£34.04 x 1,040)	35,402		1
Labour			
Skilled (28.75 x 1,040)	29,900		
Unskilled (7.50 x 1,040)	7,800		
Variable overhead (£15.00 x 1,040)	15,600		
Fixed overhead (£21.60 x 1,100)	<u>23,760</u>		1
Surplus	88,778		½ (6)

(b) Calculations variances**Sales**

Price

Actual sales x actual price 1,040 x 275	286,000		
Actual sales x standard price 1,040 x 273	<u>283,920</u>		
	2,080	F	1

Materials

Material X

Price

Actual materials x standard price (10,200 x £7)	71,400		
Actual materials x actual price (10,200 x £7.20)	<u>73,440</u>		
	2,040	A	½

Usage

Actual units x standard usage (1,040 x 9kg)	9,360		
Actual units x actual usage	<u>10,200</u>		
	840		
Standard cost per unit	£7		
	5,880	A	½

Material Y

Price

Actual materials x standard price (3,020 x £5.50)	16,610		
Actual materials x actual price (3,020 x £5.85)	<u>17,667</u>		
	1,057	A	½

Usage

Actual units x standard usage (1,040 x 3kg)	3,120		
Actual units x actual usage	<u>3,020</u>		
	100		
Standard cost per unit	£5.50		
	550	F	½

Additional parts

Price

Actual materials x standard price (50,800 x £0.74)	37,592		
Actual materials x actual price (50,800 x £0.76)	<u>38,608</u>		
	1,016	A	½

Usage

Actual units x standard usage (1,040 x 46)	47,840		
Actual units x actual usage	<u>50,800</u>		
	2,960	A	
Standard costs per unit	£0.74		
	2,190	A	½

Total materials price 4,113 A

Total materials usage 7,520 A

Labour

Skilled labour

Labour rate

Actual hours x standard price (3,020 x £11.50)	34,730		
Actual hours x actual rate (3,020 x £11.75)	<u>35,485</u>		
	755	A	½

Efficiency

Actual units x standard hours (1,040 x 2.5)	2,600		
Actual units x actual hours	<u>3,020</u>		
	420		
Standard rate per hour	£11.50		
	4,830	A	½

Unskilled labour

Labour rate

Actual hours x standard price (1,590 x £5.00)	7,950		
Actual hours x actual rate (1,590 x £4.90)	<u>7,791</u>		
	159	F	½

Efficiency

Actual units x standard hours (1,040 x 1.5)	1,560		
Actual units x actual hours	<u>1,590</u>		
	30		
Standard rate per hour	£5.00		
	150	A	½

Total labour rate variance

	596	A	
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Total labour efficiency variance	4,980	A	
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Variable overhead

Efficiency

Actual hours x standard rate (4,610 x 3.75)	17,287.5		
Standard hours x standard rate (4,160 x 3.75)	<u>15,600</u>		
	1,687.5	A	1

Rate

Actual hours x actual rate (4,610 x 3.68)	16,964.8		
Actual hours x standard rate (4,610 x 3.75)	<u>17,287.5</u>		
	322.7	F	1

Total variable overhead variance	1,364.8	A	
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Fixed overhead

Expenditure variance

Standard hours x standard rate (4,400 x £5.40)	23,760		
Actual fixed overheads	<u>25,447</u>		
Variance	1,687	A	1

Statement to Reconcile the Budgeted and Actual profit

	£		£	
Budget Profit			88,778	
Sales variance price	2,080	F		
			90,858	
Cost Variances				
Material X				
Price	2,040	A		
Usage	5,880	A		
Material Y				
Price	1,057	A		
Usage	550	F		
Parts				
Price	1,016	A		
Usage	2,190	A		
Skilled labour				
Rate	755	A		
Efficiency	4,830	A		
Unskilled				
Rate	159	F		
Efficiency	150	A		
Variable O/H				
Efficiency	1,688	A		
Rate	323	F		
Fixed O/H				
Expenditure	1,687	A		
			<u>20,261</u>	A
Actual profit			70,597	3

(12)

(c) Possible reasons for significant variances:

- Wastage of material X, possibly due to poor quality.
- Skilled labour working less efficiently than standard, possibly linked to inferior quality materials.
- Unskilled labour paid less than the standard, therefore were less efficient because they were less skilled.

Award marks for other appropriate comments to a maximum of 2

(20)

Question 3**(a)**

South Duns Health Care
Acute Operations Suite

Budget head	Base Budget £	Adjustments £	Original estimate £	November 2005 price base £
Consultant surgeons	455,160		455,160	463,125
Consultant anaesthetists (W2)	186,900	(23,404)	163,496	166,357
Theatre sister	29,200		29,200	29,930
Grade E (W3)	151,200	14,700	165,900	170,048
Grade D	192,780		192,780	197,600
Operating orderlies	44,250		44,250	45,135
Domestic assistants (W4)	37,370	(10,382)	26,988	27,528
Total Pay	1,096,860	(19,086)	1,077,774	1,099,723
Theatre gases (W5)	72,190	(722)	71,468	72,715
Non disp M&S (W1)	182,020	20,610	202,630	206,164
Disp M&S	90,520		90,520	91,520
Dressings	77,960		77,960	77,960
Repairs and maintenance	15,170		15,170	15,749
Energy	2,800		2,800	2,998
Capital charges (W6)	20,400	816	21,216	21,216
Total Non pay	461,060	20,704	481,764	488,322
Total Expenditure	1,557,920	1,618	1,559,538	1,588,045

*3 marks total
1 mark presentation*

W1	Non recurring expenditure £182,020 – £27,250 + £47,860 = £202,630	2
W2	Salaries: Anaesthetist saving £62,300 x 7/12 = (£36,342) Replacement £51,750 x 3/12 = 12,938 Overall effect saving of £23,404	1
W3	Nurse £25,200 x 7/12 = £14,700	1
W4	Domestic £12,458 x 10/12 = (£10,382)	1
W5	Gases £72,190 x 1% = (£722)	1
W6	Capital charges £20,400 x 4% = £816	1

(11)

(b) Zero based budgeting

- All activities are justified and prioritised before resources are allocated to each activity.
- Starts from a position of zero and amounts require justification.

Advantages

- Full review of resources based on need.
- Creates a questioning attitude.
- Greater staff involvement and motivational effects.

Disadvantages

- Time consuming as there is a need to start from scratch each year.
- Greater coordination and training required.
- Some services are statutory, so may be a waste of resources as these have to be provided anyway.

Activity Based budgeting

- Major activities are identified and a cost pool assigned to each activity. Cost drivers are determined and budgets are constructed on the basis of cost driver rates.

Advantages

- Better allocation of resources based on use of what drives costs.
- More accurate where overhead costs are a greater proportion of overall cost.
- Establishes a link between decision-making and cost behaviour.

Disadvantages

- Time consuming as costing system needed may be over-complex.
- Can be problems in defining activities.
- Not always possible to monitor in the short term.

Rolling budgets

- The budget period is subdivided into a number of shorter periods for which detailed operational budgets will be prepared on an ongoing basis.

Advantages

- Ensures that budget holders constantly look ahead and review their plans.
- Effective in situations where conditions are volatile and subject to uncertainty.

Disadvantages

- Managers may pay less attention to setting accurate original budgets if they know they can be changed.
- Time consuming as budgets have to be frequently reviewed.

PPBS

- Costs are classified according to the reasons that they are incurred.
- Not profit orientated.
- Not based on organisational structures but on programmes (groups of activities with common objectives).

Advantages

- Link to the objectives of the organisation.
- Links to long term planning.
- The most efficient and effective programmes are selected.

Disadvantages

- Time consuming and complicated.

Outturn method

- Detailed budgets are prepared to incorporate the full effects of inflation and developments to the year end. There is no need to have a separate contingency.

Advantages

- The whole budget is determined at the outset.
- Fits the concept of cash limits in the public sector.

Disadvantages

- If inflation is high, the budget may be inaccurate.

*3 methods required
1 mark for the description
1 mark for an advantage
1 mark for a disadvantage
(9)*

(20)

Question 4**(a)** Objectives of budgets

- To compel planning – The need to budget compels managers to think ahead and plan for any potential problems.
- There is therefore a need for managerial knowledge and judgement.
- To provide a performance benchmark and financial control mechanism by comparing actual results with those planned. Performance evaluation may be linked to performance measured by budgets.
- To provide motivation by setting targets. Whether this is achieved depends on how budgets are viewed and whether underachievement is punished.
- To provide an effective means of communication and goal congruence. Departments are forced to consider the impact they have on other departments by recognising the interrelationships that exist.
- To instil financial awareness. To make managers aware that their actions have a cost implication. It also focuses management time on activities that have a higher cost implication.
- Co-ordination of the activities and functions of the organisation, so that each department works to achieving the overall plan and objectives of the organisation.
- To authorise and delegate. Approval of the budget authorises the agreed policy and is the authority for each manager to carry out the plans contained in each budget.

½ mark for the main theme, 1 mark for development, up to a maximum of 7

(b) The key requirements for an effective system of budgetary control are:

- Timeliness – Information must be up to date.
- Accuracy – Information must be as accurate as it can be within the timescale. There is often a trade-off between timeliness and accuracy.
- Correct level of detail provided – for example, should the report be at a section level, a department level or an organisational level?
- Should show comparisons of budget and actual – this should be done both for current information and cumulatively.
- Routine and frequent reports should be provided.

1 mark for each point made, up to a maximum of 5

(c) Profiling

This is done by reference to the previous years' spending patterns. This enables the timing of payments to be taken into consideration. The budget is then matched to the pattern of the expenditure.

Example: Energy bills are profiled to reflect the higher energy consumption in the colder months. 2

Virement

This is the transfer of monies from one budget head to another. It allows for adjustment of the budget to bring it back into line with the actual. It can be used to meet overspend in one area with under-spending in another. Control must be exercised when deciding who in the organisation can authorise the use of virement.

Example: Movement of budget from pay to non-pay. 2

Other allowable examples: Responsibility accounting
 Variance analysis
 Flexible budgeting

Marks awarded for all relevant points to a maximum of 2 per example (4)

(d) Feed-forward control compares desired outcomes with predicted outcomes and attempts to exert control in advance, to remedy any significant variances. 2

Feedback control is retrospective. The budget is compared with actual, and appropriate control action is taken where significant variances arise. 2

1 mark awarded for definition and 1 mark awarded for example (4)

(20)

Question 5**(a) (i) Calculation of overhead rates**

Expense item	Department X £	Department Y £	Department Z £
Labour related expenses	25,218	14,394	7,388
Supplies of consumables	2,500	1,500	1,200
Indirect labour	21,635	12,980	10,385
Rates and insurance	6,680	4,881	1,439
Maintenance	11,954	8,644	11,402
Depreciation	7,219	4,671	6,110
Canteen costs	7,000	5,600	4,900
Total	82,206	52,670	42,824
Number of labour hours	25,000	15,000	12,000
Overhead absorption rate	£3.29	£3.51	£3.57

½ mark for each correctly apportioned expense item (3 ½ marks)

½ mark for correct totals and use of labour hours

1 mark each for overhead absorption rates (3 marks)

(7)

(ii) Current method of pricing job

Direct materials	£		
	1,120		½
Direct labour	302	(£185,000/25,000 x 20) + (£105,600/15,000 x 11) + £54,200/12,000 x 17)	1
Direct costs	<u>1,422</u>		
Overhead	<u>1,564</u>		½
Total price	2,986		½

Quote based on overhead absorption rates

Direct materials	£	£	
		1,120	
Direct labour		302	
Overhead:			
Department X (20 x £3.29)	66		
Department Y (11 x £3.51)	39		
Department Z (17 x £3.57)	61	<u>166</u>	1 ½
Production cost		1,588	1
Non production overheads at 27%		<u>429</u>	1
Total cost		2,017	
Profit margin (15% of selling price (2,017 x 15/85))		<u>356</u>	½
Selling price		2,373	½

(7)

(b) Step reapportionment (specified order of closing)

- Starts either with the support cost centre having the highest departmental overhead total after primary distribution, or with that providing the highest level of service to other cost centres.
- This centre's costs are apportioned to all other cost centres, including support centres.
- This column is 'closed off' in the analysis sheet.
- The next supports centre is then apportioned to all other centres excluding the centre that has already been apportioned.
- The procedure is repeated until all columns have been apportioned and 'closed off'.
- The percentages used to make the reapportionments should relate only to those cost centres receiving a share of the apportioned cost.
- For all service centres subsequent to the first, the amount of overhead being apportioned will consist of that centre's total from the primary distribution and a share of any other centres' overheads that have already been reapportioned.

½ mark per valid point to a maximum of 2 marks

Reapportionment by repeated distribution

- Gives full recognition to reciprocal services.
- Support centres are reapportioned in sequence to all other departments, including service centres.
- The sequence is not important as long as it is kept the same for each set of reapportionments.
- Once the first set of reapportionments has been carried out, this provides smaller figures that will form the basis for the next set of reapportionments.
- The process continues in sequence until the figures become too small, and the remainder of overhead can be split.

½ mark per valid point to a maximum of 2 marks

Algebraic reapportionment

- This method uses algebra.
- The reciprocal use of departments' services by other departments is expressed in two algebraic equations.
- The equations are then solved simultaneously.
- Can be less cumbersome than the above methods.
- Works best where there are only two reciprocal service centres.

½ mark per valid point to a maximum of 2 marks

(6)

(20)

Question 6**(a)** Contribution per switchboard

	X150 £	X500 £	
Selling price	4,000	6,000	
Components	750	1,550	
Assembly (3 x 140)	420 (9 x 140)	1,260	
Quality control (6 x 60)	360 (9 x 60)	540	
Installation (15 x 40)	600 (30 x 40)	1,200	
Total costs	<u>2,130</u>	<u>4,550</u>	
Contribution	1,870	1,450	2

(b) Objective function

$$C = 1,870X + 1,450Y \quad 1$$

Let X150 = X

Let X500 = Y

Subject to:

$$\text{Assembly time} \quad 3X + 9Y \leq 2,250 \quad 1$$

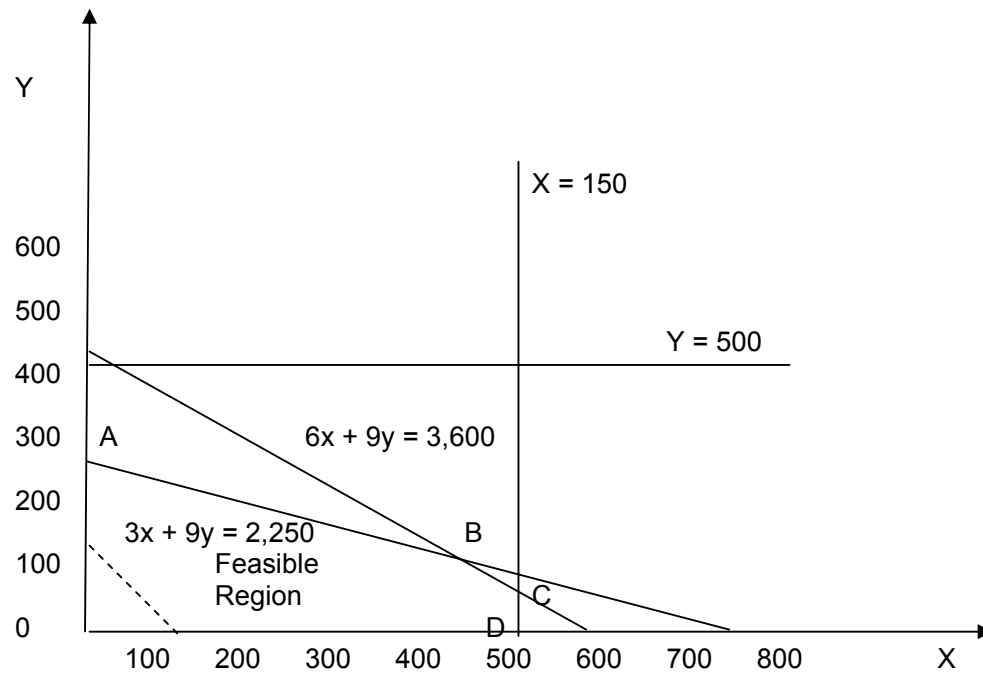
$$\text{Quality control} \quad 6X + 9Y \leq 3,600 \quad 1$$

$$0 \leq X \leq 500 \quad \frac{1}{2}$$

$$0 \leq Y \leq 400 \quad \frac{1}{2}$$

The optimum solution can be found graphically by drawing the four constraints and determining the feasible boundary:

Graphing the constraints



Workings:

$$3X + 9Y = 2,250$$

When $x = 0$

$$Y = 2,250/9 = 250$$

When $Y = 0$

$$X = 2,250/3 = 750$$

$$6X + 9Y = 3,600$$

When $x = 0$

$$Y = 3,600/9 = 400$$

When $Y = 0$

$$X = 3,600/6 = 600$$

Using the four point method:

$$A = \begin{array}{l} Y = 250 \\ X = 0 \end{array}$$

$$\text{Contribution is } (0 \times \text{£}1,870) + (250 \times \text{£}1,450) = \text{£}362,500$$

B = where $3x + 9y = 2,250$ and $6x + 9y = 3,600$ cross using simultaneous equations (or from the graph).

$$3x + 9y = 2,250 \quad (1)$$

$$6x + 9y = 3,600 \quad (2)$$

Taking (1) from (2)
 $3x = 1,350$
 $X = 450$

Substituting in (1)
 $1,350 + 9y = 2,250$
 $9y = 2,250 - 1,350 = 900$
 $Y = 100$

This gives a contribution of
 $(£1,870 \times 450) + (£1,450 \times 100) = 841,500 + 145,000 = 986,500$

C = where $6x + 9y = 3,600$ and $X = 500$ cross
 Using algebra (or from the graph)
 $(6 \times 500) + 9Y = 3,600$

$3,000 + 9y = 3,600$
 $9y = 600$
 $Y = 66$

This gives a contribution of $(£1,870 \times 500) + (£1,450 \times 66) = £935,000 + £95,700 = £1,030,700$

D = where $x = 500$ and $y = 0$
 Contribution is $500 \times £1,870 = £935,000$

The maximum contribution is therefore at point C. Where 500 of switchboard X150 and 66 of switchboard X500. This would generate a contribution of £1,030,700.

5

(9)

(c)

- Total contributions generated by the optimal solution is £365,077.
- The optimum production mix of exchanges is to produce 2,584 of the X2200 and 2,307 of the Y3300.
- Row 2 and 3 indicate unused Processing Hours and Labour Hours resources, under slack/surplus column.
- These resources are fully utilised by the optimum solution (slack/surplus = 0).
- Row 4 and 5 show the level of unsatisfied demand for X and Y:
- There is unsatisfied demand of 955 for the X2200.
- There is unsatisfied demand of 392 for the Y3300.
- The data in the dual prices column represents the change in the objective function from obtaining/losing one unit of scarce resource.
- If one more extra processing hour was obtained the contribution would increase by £2.67.
- If one more extra Labour hour was obtained the contribution would increase by £22.61.
- The X2200 has a contribution of £36 per unit and the Y3300 has a contribution of £54 per unit.
- The coefficient ranges show the range of contribution within which the optimal solution will be unchanged.
- For the X2200 the range is $£36 + £42 = £78$ and $£36 - £8.70 = £27.30$.

- For the Y3300 the range is $£54 + £17.40 = £71.40$ and $£54 - £29.40 = £24.60$.

½ mark per relevant point to a maximum of 5

(d)

- Certainty exists.
- Costs are linear.
- Revenues are linear.
- Production is equal to sales.
- Products are independent.
- Products are divisible.
- Company seeks to maximise profit.
- Applies to the relevant range.

1 mark per relevant point to a total of 4

(20)