MANAGEMENT ACCOUNTING

Professional 1
December 2000

MARKING SCHEME

Question 1

Mirren City Council

(a) **Budget outturn 2000/2001**

	Outturn budget 1999/2000 £			**Outturn budget 2000/2001 £**	
Employees					
Supervisors	50,000	+(7% x 9/12)		52,625	
Shift allowance	10,000	+(7% x 9/12)	10,525/3 x 2	7,017	*1*
Drivers	160,000	+(7% x 9/12)		168,400	
Overtime	32,000	+(7% x 9/12)	33,680/3 x 2	22,453	*1*
Operators	436,000	W. 1		441,070	
Overtime	87,200	W. 1	88,214/3 x 2	58,809	*1*
Total	**775,200**			**750,374**	
Vehicle Maintenance					
Refuse vans	40,000	X 1.06		42,400	
Supervisors' cars	2,400	X 1.06		2,544	
Total	**42,400**			**44,944**	*1*
Petrol					
Refuse vans	30,000	W. 2		25,440	
Cars	10,000	X 1.06		10,600	
Total	**40,000**			**36,040**	
Admin. Costs					
Manager	60,000	+(6% x 7/12)		62,100	
Admin. Asst.	45,000	W. 3		34,800	
Office supplies	16,000	X 1.06		16,960	
Total	**121,000**			**113,860**	*1*
Cent. Admin.					
C.A. Recharges	50,000	X 1.07		53,500	
Asset rentals	300,000	X 1.09		327,000	
Total	**350,000**			**380,500**	*1*
Total expenditure	**1,328,600**			**1,325,718**	
Total income	**1,500,000**	X 1.06		**1,590,000**	
Surplus/(deficit)	**171,400**			**264,282**	

W.1

Operators 24 WTE 436,000 + (436,000 x 0.07 = 30,520 x 9/12) = 458,890
Overtime 87,200 + (87,200 x 0.07 = 6,104 x 9/12) = 91,778

1 operator = 436,000/24 = 18,167 per month 18,167/12 = 1514 + 7% = 1620 *1*
Overtime = 87,200/24 = 3,633 per month 3,633/12 = 302.7 + 7% = 324

1st retirement 1,620 x 6 = 9,720, overtime 324 x 6 = 1,944 *1*
2nd retirement 1,620 x 4 = 6,480, overtime 324 x 4 = 1,296
3rd retirement 1,620 x 1 = 1,620, overtime 324 x 1 = 324

Operators 458,890 - (9,720+6480+1620) = 441,070 *1*
Overtime 91,778 - (1944+1296+324) = 88,214

W.2

Petrol
Refuse van mileage per day 87,600/365 = 240/8 = 30 less reduction in mileage 6 = 24
Cost per mile £30,000/87,600 = £0.34246
New mileage = 24 x 8 x 365 = 70,080
Total cost = 70,800 x £0.34246 = £24,000 x 1.06 = £25,440 *2*

W.3

Admin. Asst. 3
45,000/3 = 15,000 per asst.
Retirement = 15,000 x 3/12 = 3,750 (retires before pay rise)
30,000 + (30,000 x 0.06 = 1,800 x 7/12) = 31050 + 3,750 = £34,800

2

(13)

(b)

Incremental budgeting:

- The current year's budget is used as a basis for the next year's budget.
- It concentrates upon marginal, incremental change from one year to the next.
- There is a negotiation process to achieve compromise and consensus between conflicting groups.

Advantages of incremental budgeting:

- Simple to apply.
- Relatively cheap to implement.
- Easy to understand.

- Base budgeting allows for concentration upon key areas of change as far as policy makers are concerned.
- Many public services are mandatory - incremental budgeting fits in well with this requirement.

Disadvantages of incremental budgeting:

- It is backward looking as it looks to past budgets rather than the future requirements of the organisation.
- It assumes existing budget patterns are relevant and satisfactory.
- It does not allow for an overall review of performance.
- It is reactive rather than proactive.

ZBB:

- Involves starting from scratch and building up a budget from the knowledge of the organisation's planned objectives over the budget period.
- A systematic review and justification of the funding and the performance of current programmes.
- This is carried out by identifying decision units, preparing decision packages, ranking the decision packages and preparing the budget.

Advantages of ZBB:

- A systematic re-appraisal of the base budget.
- Involvement of managers at all levels.
- ZBB clearly defines organisational objectives and goals.
- It is capable of dealing with changing circumstances.
- It enhances knowledge of inputs and outputs.
- ZBB improves communication and management consensus.
- There is a better allocation of resources.

Disadvantages of ZBB:

- It is a highly complex process.
- ZBB requires special skills and training.
- There is a tendency towards bureaucracy and a proliferation of paperwork.
- ZBB is expensive and time consuming.

7 marks are awarded here but candidates are expected to cover both areas; if only one area is covered only up to 4 marks can be awarded.

1 mark per point up to a maximum of 7

(20)

Question 2

Oldways NHS Trust

(a)

Elderly Unit monitoring statement month six – year ending 31 March 2001

	Annual budget £	Budget to date £	Expenditure to date £	Variance (-o/spend) £	
Pay					
Doctors (W1)	220,000	110,000	103,333	6,667	*1*
Nurses (W2)	307,500	153,750	153,750		*1*
Nursing Assistants (W2)	82,000	41,000	46,000	-5,000	*1*
Patient Administrator (W3)	18,778	9,319	7,777	1,542	*2*
Total pay	628,275	314,069	310,860	3,209	
Non pay					
Supplies (W5)	313,320	156,660	158,540	-1,880	*1*
Drugs	124,480	62,240	65,500	-3,260	
Laundry and linen	10,800	5,400	5,800	-400	
Printing	-	-	1,525	-1,525	
Stationery	2,260	1,130	1,100	30	
Office equipment	1,750	875	-	875	
Repair and maintenanc (W7)	6,000	3,000	3,000		*1*
Computer hardware and software (W6)	3,300	1,650	3,250	-1,600	*1*
Travel	4,540	2,270	2,000	270	
Books and periodicals (W4)	-	-	-		*1*
Recharges					
Domestics	12,840	6,420	9,000	-2,580	
Porters	900	450	450	-	
Catering	140,000	70,000	68,000	2,000	
Hospital overheads	20,500	10,250	11,958	-1,708	
Total non pay	640,690	320,345	330,123	-9,778	
Total expenditure	1,268,968	634,414	640,983	-6,569	

(9)

W.1 Doctors

Adjust annual budget £180,000 + 40,000 = £220,000
Adjust budget to date to £110,000

W.2 Nurses/ nursing assistants
Nurses
Adjust annual budget £300,000 x 1.025 = £307,500
Adjust budget to date £150,000 x 1.025 = £153,750
Nursing Asst.
Adjust annual budget £80,000 x 1.025 = £82,000
Adjust budget to date £40,000 x 1.025 = £41,000

W.3 Elderly Administrator

Adjust annual budget £18,500 + (18,500 x (0.0225 x 8/12)) = £18,778
Adjust budget to date £9,250 + (9,250 x (0.0225 x 2/6)) = £9,319

W.4 Books and periodicals

Actual to date £1,540 to 0

W.5 Supplies

£157,540 + 1,000 = £158,540

W.6 Computer hardware and software

Reduce actual to date to £3,250

W.7 Repairs and maintenance

Increase budget to date by £3,000 as it does not appear to be profiled.

(b)

As at the end of September 2000 the elderly unit is overspent by £6,569. If this trend continues the unit will be overspent by (£6,569+£6,569 + non-recurring saving of £6,667 on month delay in doctors appointment) £19,805. Out of a total budget of £1,268,968 this represents a 1.6% overspend. *1*

Areas of concern:

Nursing Assistant has been off work for 6 months resulting in £5,000 overspend due to temporary agency replacement.

How long will this continue?
Effect on year-end budget if continues?
Possibilities of virement to offset overspend? *1*

Printing has incurred non-budgeted expenditure. Establish the reason, for example coding error, one off item of expenditure, if not do we have to include in future budgets? *1*

Office expenditure is budgeted for but no expenditure has yet been made. Check profiling? Check coding. *1*

Computer hardware and software overspent by £1,600. Investigate to see if the trend will continue or is profiling incorrect. If overspending is likely to continue virement may have to be considered. *1*

Domestics and Hospital O/H are currently overspent. This may be unexpected as it is profiled equally over 12 months. Check for wrong coding or some extra service provided. May be due to wrong coding therefore correcting journal entry may be required. *1*

(1 mark per point up to a maximum of 6)

(c)

Currently only annual budget, cumulative budget and actual expenditure to date are shown.

Improvements:
Budget and expenditure for the current month could be shown,
Year-end forecasts for each budget line,
Addition of last years cumulative position for comparisons,
Budget and actual staff WTE. for each type of staff,
Volume of activity through the unit ie bed occupancy rates,
Automatic flagging up large variances in % and actual amounts,

1 mark per point up to a maximum of 5

(20)

Question 3

(a)

Aims and objectives of capital budgets (answers as per OLM)

- To estimate total capital expenditure requirements, which can be matched to the available finance or financial approvals.
- To produce a co-ordinated programme and set priorities.
- To identify individual capital schemes and indicate their priority status.
- To act as a means of co-ordinating the efforts of different departments.
- To provide the basis for the estimation of the revenue effects of the capital programme.
- To help in the physical planning of capital projects.
- To provide the basis for determining cash flow and capital financing requirements.
- To provide information for external bodies.
- To form a standard for control and monitoring.

1 mark per point to a maximum of 6
(6)

(b)

Nature of capital budgets as compared with revenue budgets

Nature of capital budgets

- Expenditure is upon assets, which have a life of more than one financial year.
- Capital projects may begin and end in different financial years.
- Individual capital projects may involve large amounts of money.
- Capital expenditure may have considerable impact on revenue budgets.
- Capital finance will often involve deferring payment until future years, for example borrowing

Nature of revenue budgets

- Expenditure is consumed in the relevant financial year.
- Expenditure is generally on recurring items , for example salaries and wages
- Expenditure pattern is often related to the previous year's expenditure pattern.
- Large percentage of the budget is on salaries and wages.

1 mark per point to a maximum of 7
(7)

(c)

Constraints on capital budgeting

Finance
- Legal constraints on borrowing or other credit arrangements.
- Size and availability of any internal sources.
- Receipts from the sale of assets.
- Income received from outside bodies and the restrictions on usage, for example. EU.

Revenue
- May not have the revenue finance to fund the running of the capital project once completed.
- Funds available to meet future loan repayments.

Political
- Political policies and priorities restrict capital budgeting projects.

Other
- Project lead in time.
- Difficulty in accurate budgeting for several years ahead.

1 mark per point to a maximum of 4
(4)

(d)

Monitoring procedures
- Monitoring the overall financial position, cash flow, financing arrangements and compliance with financial controls.
- Physical progress against project schedules and impact upon revenue budgets and budgetary control.
- Control over individual schemes.

1 mark per point to a maximum of 3
(3)

(20)

Question 4

(a)

(i) **High and low points method**

	Machine hrs 000	**Gas cost £000**
High (month 10)	48	1360
Low (month 6 or 7)	26	1000
Difference	22	360

1

Variable cost per machine hour = £360/22 = £16.36 *1*

Substituting in month 10:
V.C. (48 x £16.36) £785.28
F.C. (£1360 - £785.28) £574.72 x 1,000 = £574,720 *1*
T.C. £1,360,000

y = a + bx
Therefore
y = £574,720 + £16.36x *1*

or

Substituting in month 6/7:
V.C. (26 x £16.36) £425.36
F.C. (£1,000 - £425.36) £574.64 x 1,000 = £574,640 *1*
T.C. £1,000,000

y = a + bx
Therefore
y = £574,640 + £16.36x *1*

(4)

(ii) **Least squares regression method**

Month	**Machine hours 000**	**Natural gas £000**		
	x	**y**	**x^2**	**xy**
1	30	1,240	900	37,200
2	34	1,280	1,156	43,520
3	39	1,180	1,521	46,020
4	34	1,240	1,156	42,160
5	42	1,000	1,764	42,000
6	26	1,000	676	26,000
7	26	1,000	676	26,000
8	32	1,060	1,024	33,920
9	31	1,060	961	32,860
10	48	1,360	2,304	65,280
11	35	1,100	1,225	38,500
12	43	1,160	1,849	49,880
	420	**13,680**	**15,212**	**483,340**
Marks	*1*	*1*	*1*	*1*

$b = n\sum xy - \sum x\sum y / n\sum x^2 - (\sum x)^2$

$a = \sum y / n - b\sum x / n$

$b = (12 \times 483340) - (420 \times 13680)/(12 \times 15212) - (420)^2 = 8.867$ *2*

$a = 13680/12 - (8.867 \times 420/12) = 830$ (rounded) (829.65 not rounded) *2*

$y = £830,000 + £8.867x$ *2*

or $y = £829,650 + £8.867x$

(14)

(b)

Compare the two methods used with the graphical or scattergraph method.

High/low method gives a simple indication of cost behaviour, generally less accurate than a statistical estimate line of best fit.

Use of highest and lowest points means that the majority of observations could be either higher or lower than the line drawn between the highest and lowest point - they may not be representative of the normal conditions.

Regression establishes the statistical line of best fit based on all 12 observations - this is more reliable. However this may still be inappropriate as it inherently assumes linearity in the cost relationship (all costs are fixed and/ or variable). This does not allow for semi-fixed costs.

The scattergraph method suffers from the disadvantage that the determination of exactly where the straight line should fall is subjective and different people will draw different lines with different slopes, giving different cost estimates. Therefore the mathematical method is preferred.

2 marks for short comparison of each method and its weaknesses
(6)

(20)

Question 5 (a)
Supplier X quotation

year	0	1	2	3	4	5	6	7	8	9	10	Total Cost
Capital Trans.	(900,000)										20,000	
Maint.		(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)		
Net cash flow	(900,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	20,000	
P.V.	1.00	0.9434	0.89	0.8396	0.7921	0.7473	0.7050	0.6651	0.6274	0.5919	0.5584	
Disc. cash flow	(900,000)	(70,755)	(66,750)	(62,970)	(59,407.5)	(560,47.5)	(52,875)	(49,882.5)	(47,055)	(44,392.5)	11,168	(1,398,967)

Therefore present value = (1,398,967)
The annual equivalent cost is (190,077) calculated as the present value divided by the 10 year cumulative present value factor, 7.360

Cumulative present value (CPV) factors have been used to calculate the present value of the maintenance payments 75,000 x 6.802(9 years) = £510,150
This is therefore cheaper than the lump sum of £540,000 and is used in the appraisal of supplier X. *4*

Supplier Y quotation

year	0	1	2	3	4	5	Total costs
Capital trans.	(735,000)					110,000	
Maint.		(72,000)	(72,000)	(72,000)	(72,000)		
Net cash flow	(735,000)	(72,000)	(72,000)	(72,000)	(72,000)	110,000	
P.V.	1.00	0.9434	0.89	0.8396	0.7921	0.7473	
Disc. cash flow	(735,000)	(67,924.8)	(64,080)	(60,451.2)	(57,031.2)	82,203	(902,284.2)

Present value is 902,284.2

The annual equivalent cost is (214,217.52) calculated as the present value divided by the 5-year cumulative present value factor, that is 4.212.

Therefore select supplier X as this has the lowest annual equivalent cost. *4*

(8)

(b)

Weaknesses of the ARR

- The averaging process hides the timing of the returns.
- The calculation ignores the time value of money.
- ARR has no generally accepted definition, for example can use different versions giving different results.
- Profit is not the best basis for measuring the impact of decisions, for example profit can be affected by method of depreciation chosen.
- ARR is expressed as a %. This gives no indication of the size of the proposal.

maximum of 3 marks for this part

Weaknesses of Payback Period

- Ignores the time value of money.
- Gives no indication of the amount of capital investment required, nor of the overall cost/benefit resulting from acceptance or rejection of a proposal.
- Cash flows which arrive after the payback period are ignored.

maximum of 3 marks for this part

Advantages of NPV

- Takes account of the time value of money.
- Incorporates all cash flows over the proposals life.
- It can be used in making comparisons between competing projects as the cost and benefits are clearly stated.

maximum of 2 marks for this part

1 mark per point up to a maximum of 8

(8)

(c)

Opportunity cost in a capital project.

If the cash is invested in this capital project it cannot be invested elsewhere to earn a return (i.e. the opportunity foregone). A firm should only invest in a capital project if it yields a return in excess of the opportunity cost. *2*

Time value of money

The concept that £1 received in the future is not equal to £1 received today is known as the time value of money. *2*

(4)

Question 6

RoadsRUS

(a) Consequences of undertaking the contract

	Burns CC	**Hart CC**
	£000	**£000**
Contract revenue	850	900
Sales of materials held for the Burns contract (W.1)		120
Savings in material purchases by alternative use of materials for Hart contract (W.2)	240	
Hire of plant	10	
	1,100	1,020
Incremental costs		
Materials to be ordered (W.3)	200	170
Project Engineer's travel, lodgings etc.(W.4)	20	20
Labour (W.4)	350	280
Penalty for cancelling (W.5)	40	80
	610	550
Excess revenue/savings over incremental costs (W.6)	490	470
	4	*4*

Notes

(W.1)

If the Hart job is undertaken, sales of materials no longer required for the Burns job would be as follows:

Materials held at cost £100,000

Current money value (add 60%) £160,000 *1*

Sales price (90%) £144,000 LESS Transportation etc. costs (16.67%) £24,000 = £120,000

(W.2)

If the Burns job is undertaken, the materials for the Hart job might be re-used on a different contract, thereby saving the purchase of additional materials.

Materials held £120,000 + Materials contracted for £180,000 = £300,000 *1*

Savings in purchases on different contract (80%) = £240,000

(W.3)

The materials contracted for to carry out the Hart job must be paid for whatever happens. Although not yet received, they are paid for whichever (if either) contract is undertaken. It is therefore not an incremental cost chargeable to Hart contract. *1*

For similar reasons, materials already held are not an incremental cost to their respective contracts. The alternative use of materials not required is, however, significant - and this has been taken into account on the revenue side of the analysis.

(W.4)
It is assumed that the project engineer's salary is a fixed cost, whichever contract is undertaken. Incremental labour costs are therefore travel, lodgings etc. and labour. *1*

(W.5)
The penalty cost of failing to undertake one contract should be treated as a consequential cost of undertaking the other contract. *1*

(W.6)
The excess of revenue/savings over incremental costs calculated for each contract shows the comparative effect on profits of undertaking each job in preference to the other. The difference between the two figures (£490,000 and £470,000) shows that there is a difference between the two projects of £20,000 in favour of the Hart job. *1*

(14)

(b)

The approach used assumes only one of the projects will be undertaken. Some costs have already been incurred, for example some materials, others committed, for example project engineers salary and others are notional, for example interest on plant

Only relevant considerations should be taken into account:
- Future revenues or cash savings as a consequence of the decision.
- Future costs, incurred as an additional expense as a consequence of the decision.

In the solution to part (a), incremental revenues are the revenues from the contract undertaken, alternative uses of materials held but not required, and hire of plant. Incremental costs are only those additional costs which would be incurred as a result of the decision to undertake one of the contracts. *2*

(c)

Other factors to be considered are as follows:
- The constraints on working which make the contract mutually exclusive, for example only one project engineer, can this be overcome thus allowing both projects to be undertaken?
- The likelihood of another more profitable project arising?
- Loss of goodwill and future contracts by not undertaking either project.
- Reliability of prospective customer.

- Reliability of costs forecasts, labour availability etc on each contract. The net difference between each project is small, £20,000, some sort of sensitivity/risk analysis may be important.
- The preference for the Burns job is dependent on an alternative use for the Hart contract materials. If this does not materialise then preference would shift to the Hart contract. This has to be taken into account.

1 mark per relevant point to a maximum of 4

(20)