ACCOUNTING FOR DECISION MAKING

Professional 2 examination
3 December 2002

From 10.00 am to 1.00 pm
plus ten minutes reading time from 9.50 am to 10.00 am.

Instructions to candidates

*Answer **four** questions in total. **Question 1** from **Section A**, and **three** questions from **Section B.***

All workings should be shown. Where calculations are required using formulae, calculators may be used but steps in the workings must be shown. Calculations with no evidence of this (for example, using the scientific functions of calculators) will receive no credit. Programmable calculators are not permitted in the examinations room.

Formula sheets, statistical tables, graph paper and cash analysis paper are available from the invigilator, where applicable.

Where a question asks for a specific format or style, such as a letter, report or layout of accounts, marks will be awarded for presentation and written communication.

SECTION A (Compulsory)

1 Igwell Agricultural College has recently been experiencing financial problems, having run at a deficit for three years. The funding body has begun to place pressure on the College's Board, insisting that they take immediate action to balance their books. At the same time the external auditors have made a number of comments in a recent management letter. One of their comments related to the method of accountability for both the departments directly providing education as well as support departments. Their recent report states:

"The College has, over the years, run a form of decentralised management. Budgets are passed down to the heads of academic departments as well as to the support department heads. However, the budgets appear to include only the staff and other direct costs of the departments, with managers neither being charged for other overhead costs nor given credit for the incomes that they generate. Whilst senior management have attempted to balance the budget of the College and then imposed budgets onto the department heads, it would appear that those setting the budgets are removed from those directly controlling the costs and income streams of the College. The College should consider devolving the budgetary system to the heads of the academic departments as they are the managers who can influence cost and income streams. This would allow for each academic department to be charged their direct costs as well as a share of all of the other overheads of running the College, whilst the income streams could also be allocated to the department to whom the students are attached. It may also be possible to charge the different costs and incomes to the activities within the departments. One further area of weakness would appear to be the College's lack of control of the support departments."

The senior management of the College has approached you, as management accountant, to carry out a pilot project. The project will assist the management in their consideration of the future control systems adopted by the organisation as a whole.

Pilot project

One of the smaller departments in the College, the Department of Farm Management, has been selected to pilot a new system.

The objective of the pilot project is to construct a value based management system for this Department, where all costs and incomes should be charged to the department in the first place and then to the modules and other activities run within the department. In this way it would be possible to evaluate the surplus/deficit position of the department as a whole, as well as by each module that the department provides. Senior management believe that this information will provide the full costs of the main activities of the College, eg the provision of different modules to the students, research activity etc.

The following details have been collected for the Department of Farm Management for the current financial year:

1. The Department provide 6 modules, the codes of which are as follows:

   FMYR1: Farm Management I
   FMYR2: Farm Management II
   FMYR3: Farm Management III
   FHRYR2: Farming Human Resource Issues
   FECYR2: Farming Economics
   FADMYR2: Farming Administration

   The Department also runs a limited number of research projects (which generate £20,000 of income) and income generation projects such as short courses (which generate £10,000 of income).

2. The Department has managed to collect the following information regarding how their staff time is spent:

Module code	Academic staff hours Note 1	Number of students taking the module	Income allocated per student Note 2	Income earned
			£	£
FMYR1	840	150	750	112,500 (150 x £750)
FMYR2	720	120	800	96,000
FMYR3	640	60	850	51,000
FHRYR2	720	50	800	40,000
FECYR2	720	50	800	40,000
FADMYR2	720	50	800	40,000
	4,360	480		379,500
Other activities				
Research, income generation & unallocated time	1,040			30,000
	5,400			
Head of Department: management duties	600			
	6,000			

Note 1: The teaching hours, as shown in the table above, were collected by asking the Head of Department how many hours were spent tutoring the students. These were weighted in relation to the type of tuition offered to cover preparation, exam setting and marking etc. Thus a 1 hour lecture was weighted by a factor of 4 hours per hour of lecturing to cover preparation etc, whilst a 1

hour tutorial was weighted as 2 hours. There are 6 academic members of staff in the Department, including the Head of Department.

Each staff member is contracted to offer 1,000 hours, with the remainder of those not given to teaching being given over to research and income generation.

Note 2: The income has been allocated to the different modules based on the income received from each student each year, allocated equally by the number of modules that the student has taken in that year. Thus if a student's fee income in the year was £4,500 and they took 6 modules, each module would be allocated £750 of fees.

3. The costs related to the running of the Department's activities as shown in the budget are:

Salaries:	£
Head of Department (1 Full time equivalent (FTE))	45,000
Other academics (5 FTE's)	150,000
Non-academic staff (.5 FTE's)	8,000
Direct cost of consumables (These consumables are 50% related to general office expenses and 50% related to student related teaching activities).	40,000

4. Central overheads:

The College has considered its overheads and has decided to charge its overheads to departments on the basis of appropriate cost drivers as detailed on the next page (the Farm Management's cost drivers are also shown):

Type of expense	Total College Overheads £	Cost driver	Total number of cost driver incidences within College	Total number of cost driver incidences within the Farm Management Department
Related to staff in academic departments				
Personnel department	250,000	All staff in academic departments	125	6.5
Staff canteen deficit	40,000	All staff in academic departments	125	6.5
IT support (30%)	150,000	All staff in academic departments	125	6.5
Finance office (60%)	225,000	All staff in academic departments	125	6.5
	665,000			
Related to academic staff				
Research and commercialisation department	80,000	Academic staff	90	6
Related to the number of modules				
Quality audit office	75,000	Number of modules	150	6
Related to student FTEs (see note (i) on next page)				
Student refectory deficit	75,000	FTE students	2,400	80
Student residences deficit	80,000	FTE students	2,400	80
Sports and recreation	140,000	FTE students	2,400	80
Academic administration	200,000	FTE students	2,400	80
Audio visual department	130,000	FTE students	2,400	80
IT support (70%)	350,000	FTE students	2,400	80
Finance office (40%)	150,000	FTE students	2,400	80
Career guidance	50,000	FTE students	2,400	80
	1,175,000			
Related to books/journals				
Library	400,000	Number of books/journals	27,500	3,000
Related to space				
Building maintenance	200,000	Academic space, metres squared	7,000	600
Building depreciation	120,000	Academic space, metres squared	7,000	600
Building finance costs	60,000	Academic space, metres squared	7,000	600
Portering and cleaning	200,000	Academic space, metres squared	7,000	600

580,000

Note (i): The students are allocated to departments based on where they study. Thus a student who takes one of their six modules in a year within the Farm Management Department will be allocated 1/6 of that student's FTE.

Project Outline

The project outline is as follows:

- The aim is to charge all incomes and costs (including central overheads) to the department in the first instance.
- The total costs should then be split between the different modules being offered in the department as well as one other heading to cover "Other Activities" including research and income generation activities.

The steps involved in allocating costs and incomes to a department should be as follows:

- The central costs should be allocated to the Department based on activity based cost drivers calculated using the information given.
- Income should then be allocated to the individual modules and "Other Activities" category based on the activity to which it relates.
- Teaching costs should be allocated to the individual modules and "Other Activities" category based on the time spent by academic staff on those activities.
- The direct consumables costs should be allocated to the individual modules based on the number of students on the modules (no costs should be charged to the "Other Activities" category).
- The overheads (central and departmental) that have been allocated to departments should then be allocated to the individual modules and "Other Activities" category based on the time spent by academic staff on those activities.

Feedback from management

Feedback from management on the model suggested has been mixed. One non-academic member of the College Board stated during discussions:

"This proposed system is similar to activity based costing as it will attempt to cost the different activities, in this case modules. However, there is an added advantage here in that we can also consider the value of the modules and see where deficits and surpluses are being made. This will greatly assist our decision making".

However, an academic member of the College Board was unhappy as he believed that:

"Academic heads would be held responsible for all of the costs that are ultimately charged to them whilst they are, in fact, only in control of a small percentage of them. There needs to be some accountability of the central costs of the institution by those in control of those areas".

Another academic member of staff stated:

"Any system of allocating central overheads to departments will be based on arbitrary and subjective judgements. This, in my opinion, invalidates any of the findings it provides. However, to further break the overheads down to modules is ludicrous; what conceivable method of allocation can they use to carry this out?"

- **Requirement for question 1**

Prepare a report to management that:

(a) Explains the techniques of Activity Based Management and Value Analysis, outlining their advantages and disadvantages. *8*

(b) Gives, in an appendix, the value based information as outlined in the project specification for the Farm Management Department as a whole, for each module and for the "Other Activities" category showing the following:

- The income streams.
- The direct costs.
- The contribution earned.
- The central and departmental overhead costs allocated.
- The surplus and deficit. *18*

(c) Analyses the information calculated in (b), stating clearly conclusions made and areas for further study. *6*

(d) Discusses the strengths and limitations of the model you have constructed above, reflecting on the comments made by management in your deliberations. *8*

(40)

SECTION B (Answer three questions)

2 As part of Government Welfare reforms, resources had been set aside to improve customer services, including the development of communications with the public over the internet. One public service body decided two years ago to develop a website whereby customers could complete support claim forms (of which there are two such forms C101, C102) over the internet rather than completing them in writing or by visiting the organisation's premises.

The following specifications were detailed in the initial agreed project outline:

Development of Website Project Outline

1 Aim: To introduce on-line, downloadable claim forms, including appropriate supporting advice and guidance for completion by the client via the internet.

2 Targeted Project duration:
Commence 1/7/00
Completed 31/3/01
On line with customers from 1/4/01

3 Project costs:

Web consultants	£58,000
Equipment	£16,000
Training	£8,000
Promotion costs	£10,000

4 Projected savings

Staffing and related costs per annum (through non-replacement of staff): 2 FTE staff within 1 year, £30,000.
Reductions in print related costs: £25,000 per annum.

5 Risk assessment as at 1/6/00

	Description	Impact	Likelihood	Comment
5.1	Unable to produce the forms in timescales	High	Unlikely	Assurance from consultants

5.2	Lack of skills to utilise system at the department once customers have completed form	High	Possible	Need for appropriate training
5.3	Increased risk of fraud	High	Possible	Get internal audit to review potential abuse of the system
5.4	The clients do not use the system	High	Possible	Need to promote the system

6 Targets regarding the use of the system, by March 2002:

- 50% of the clients to be completing the forms via the internet.
- Reduction of requests for forms to be posted out by 40%.
- Ability to update the forms in line with changes to legislation etc within 24 hours.
- Customer complaints regarding the processing of claims to be 1% of forms processed.
- Forms requiring remedial work to reduce to 5% of forms processed.

The following information has been made available at 10 April 2002 regarding the system's implementation. It should be noted that the overall volume of demand for the different types of claim are the same in 2002 as in 2001 ie 50,000 completed returns:

Systems completion date:	1 January 2001
Consultants costs	£64,500
Equipment	£14,000
Training	£6,000
Promotion costs	£7,500
Savings:	
Staff savings	Nil
Printing	£10,000

Information for year to 31 March 2001:	Form C101	Form C102	Total
Forms requested and posted	25,000	35,000	60,000
Forms completed manually and returned for processing	20,000	30,000	50,000
Complaints regarding processing of forms	300	400	700
Forms requiring remedial work	2,500	3,500	6,000
Information for year to 31 March 2002:			
Forms requested and posted	15,000	25,000	40,000
Forms completed manually and returned for processing	14,000	22,000	36,000
Forms completed via the internet	6,000	8,000	14,000
Complaints regarding processing of forms	250	325	575
Forms requiring remedial work	1,000	2,000	3,000

It should be noted that form C102 required amending on the website in November 2001. This, however, took seven working days to complete due to operational problems.

- **Requirement for question 2**

(a) Discuss the advantages of applying the technique of post completion audit on the project. *6*

(b) Management have asked you to review the progress of the internet project. Prepare a memorandum which appraises the project's progress against projected costs, savings and performance targets. *14*

(20)

3 Stobsworth County Council need to purchase six new refuse collection vehicles in the near future. The expenditure has been authorised by the Council and various potential vehicles and suppliers have been considered. The supplier selected has stated that they would be willing to supply the requisite vehicles for £900,000. However, another supplier, a vehicle leasing company, has proposed a leasing agreement of £200,000 per annum for the next five years (payable each year in advance).

It should be noted that Stobsworth County Council is exempt from tax whereas the supplier is liable to corporation tax at 30% (assume, for simplicity, that it is payable one year after the accounting period). The leasing company is believed to be able to obtain a trade discount of 15% on the cost of the vehicles and can apply capital allowances (the annual rate being 25% reducing balance) against the costs of purchasing the vehicles. It is anticipated that the vehicles will have a life of five years and have a residual value £213,574.

The County Council applies its market cost of borrowing of 6% to investment appraisals. The leasing company wishes to use a weighted average cost of capital with the following information being pertinent:

The real risk free rate of return is 5%
The market return on a portfolio of shares is 11%
The company's β is 1.1

The company's long term financing per its balance sheet is as follows:

	£
Ordinary share capital (50p shares)	100m
Reserves	200m
Debentures (7%)	100m
Total	400m

It should be noted that the current market price for the ordinary shares is £2.10 whilst the debentures have a market value of £125 per loan stock par value of £100.

Inflation should be ignored in all calculations.

- **Requirement for question 3**

(a) Assume you are the Council's Management Accountant.

- Evaluate whether the Council should purchase the vehicles outright or lease them for the five year period.
- Calculate the change in annual leasing charge that would change the Council's decision. *5*

(b) Assume that you are the Accountant of the leasing company. You have been informed that the Council is considering either buying or leasing the vehicles.

- Calculate the Net Present Value of the present leasing agreement to your company.
- Calculate the lowest annual lease charge that the leasing company would be willing to accept in order to win the contract. *10*

(c) Comment on your findings above, including comments on other factors that the leasing company and the Council should take into consideration in their deliberations over the lease values. *5*

(20)

4 Mathers NHS Trust runs several hospitals over a wide geographic area and has recently undergone a major restructuring of its transportation and treatment of clinical waste ("any waste which consists of human/animal tissues, blood or other body fluids"). The catalyst for this change was a European Directive requiring member states to adopt legislation relating to the "carriage of dangerous goods by road".

The Trust has recently purchased vehicles, standardised waste containers and a treatment plant that will meet the requirements of the legislation and has restructured its staffing levels and routing schedules between hospitals and its own waste treatment plant.

The manager of the waste treatment plant has a separate budget for his area of responsibility but is unsettled in his mind as to what the revenue cost implications may be for the forthcoming year. He has approached the Trust's management accountant asking that she prepare appropriate figures for him. During a meeting with the management accountant he recognised that there were two key elements that he was unsure of:

- the learning effect at the treatment plant where the standardised waste containers are treated; and
- the volume of waste forthcoming from the Trust hospitals.

The following information is pertinent:

The standardised containers hold 5kgs of waste and are input into the treatment plant in batches of 100 containers, ie the standardised containers are batched in groups of 100 and entered together into the treatment process. It is expected that the preparation of the plant and containers for the first batch will cost £20 in terms of labour. It is also expected that there will be a 90% learning effect relating to the processing of the batches. Variable overheads are expected to be 30% of the labour costs. Material costs for chemicals are expected to be £2 per batch whilst fixed costs are predicted as £1,300,000 for the year. However the manager believes that, should the volume of waste rise above 160,000 batches per annum, an increase of fixed costs of £700,000 would be anticipated.

- **Requirement for question 4 parts (a) and (b)**

(a) Calculate the budgeted costs for running the treatment plant for the year, given that there will be annual clinical waste of 75,000 tonnes (1 tonne = 1,000 kg) given the information above. Note that the index of learning factor b, in the learning curve equation $y = ax^b$, is – 0.152 for a 90% learning effect. *6*

(b) It can be argued that within most areas of the public sector the learning curve is of limited use. An "experience curve" effect would still be present and be of importance. Discuss the validity of this statement. *4*

(c) The manager asked that some form of sensitivity analysis be prepared for the revenue budgets for the forthcoming year for the treatment plant. He is particularly concerned about the learning effect and volume level variables.

The manager has considered the parameters for the learning effect and output levels and has listed his thoughts of all possible outcomes providing probabilities against each as follows:

	Probability
Learning curve 92%	25%
Learning curve 90%	40%
Learning curve 88%	35%
	100%

Volume 20% below assumed level	0%
Volume 10% below assumed level	20%
Volume at assumed level	50%
Volume 10% above assumed level	20%
Volume 20% above assumed level	10%
	100%

The management accountant utilised a spreadsheet model and prepared a two-way table as follows, where the values represent the projected underspends and overspends from a proposed budget of £2,500,000 given different output levels and learning effects. For example, if a 92% learning effect was experienced and output was as expected, then an overspend of £29,780 would occur.

	Output 20% less than assumed level	Output 10% less than assumed level	Output at assumed level of 75,000 tonnes	Output 10% more than assumed level	Output 20% more than assumed level
	£	**£**	**£**	**£**	**£**
Learning curve 92%	195,943	82,528	-29,780	-841,110	-951,540
Learning curve 90%	432,626	347,235	262,779	-520,883	-603,769
Learning curve 88%	598,969	532,563	466,886	-298,125	-362,538

- **Requirement for question 4 part (c)**

Calculate the expected monetary value of the budget expenses for the year. Also calculate the percentage likelihood of the actual expenditure being below the budget set. Comment on your findings. *10*

(20)

5 Management accounting has been criticised in the recent past as being irrelevant to the needs of the managers it serves. Included in these criticisms were comments regarding:

- the lack of information for strategic management;
- a short term focus;
- a preponderance of financial factors;
- a focus on inputs with little comment on outputs; and
- a neglect of consideration for anything other than the production sector.

This has led, in the last 15 years, to the development of a number of new techniques including value chain analysis, external benchmarking, target costing, life cycle costing and balanced scorecard.

- **Requirement for question 5**

Select four of the above techniques, outlining how they function and how they provide greater relevance for the not–for–profit sector. *20*