

ACCOUNTING FOR DECISION MAKING

Professional 1 examination 8 December 1999

From 2.00 pm to 5.00 pm
plus ten minutes reading time from 1.50 pm to 2.00 pm.

Instructions to candidates

Answer **four** questions in total. **Question 1** from Section **A**, and **three** questions from Section **B**. The marks available for each question are shown in italics in the right-hand margin.

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.

SECTION A (Compulsory)**1**

Tidytown County Borough Council is investigating options for reducing its use of landfill sites for waste disposal, in the light of proposed increases in landfill tax.

It has identified two possible alternatives, either to purchase an incinerator, or to build a recycling plant.

The estimated capital cost of the incinerator is £1.9m, and the recycling plant £3m. The council has sufficient credit approval to proceed with either project, and its current nominal cost of capital is 8%.

Either project would save landfill tax of £500,000 in the first year of operation. This saving is expected to increase in future years, as the government has expressed an intention to increase landfill tax at a rate of 10% per annum.

The estimated annual running costs of each option, at current prices, are as follows:

Incinerator:

Costs	£
Salaries and wages:	50,000
Power:	100,000
Maintenance:	3,000

Savings

The heat generated from the incinerator can be used to heat neighbouring council offices. It is expected to save £40,000 per annum on heating bills, which are expected to rise in line with power costs (see below).

Recycling Plant:

Costs	£
Salaries and wages:	100,000
Power:	40,000
Maintenance:	12,000

Savings

In addition to the landfill tax savings, the sale of recycled products is expected to yield £325,000 in the first year. However, prices for recycled products are not expected to increase over the five year period.

All costs are expected to increase by 5% per annum, except landfill tax.

Both projects have an estimated useful life of 5 years.

- **Requirement for question 1**
 - (a) Calculate the Net Present Value of each option, and discuss how far the result can be used as a basis for deciding which option is financially more attractive. 15
 - (b) Outline how non-financial factors, such as the environmental impact of these proposals, might be included in the appraisal process, and discuss the impact on the appraisal if the useful life of either project were likely to extend beyond five years. (No calculations are required) 6
 - (c) Identify the change in annual income from recycled products necessary to make the NPV of the recycling plant equal to that of the incinerator, assuming an estimated useful life of five years. 4
- (25)

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SECTION B (Answer three questions)

Lazybones District Council runs a swimming pool. The pool is currently open from 7am to 10pm Monday to Saturday, and from 9am to 7pm on Sunday. The current weekly running costs are summarised below:

	£ per week
<u>Direct costs</u>	
Power for water heating and wave machine	1,000
Staff (pool attendants)	1,400
Equipment and chemicals	100
<u>Indirect costs</u>	
Managers and receptionists salaries	325
Heat, light and cleaning	100
Apportionment of leisure and amenities department overheads	<u>75</u>
Total weekly cost	3,000

The Swimming Pool manager has received a request from a local swimming club which wishes to hire the pool from 7pm to 10pm every Sunday evening. They have made an initial offer to pay £40 per evening, and are willing to sign a one-year contract, covering 50 weeks hire. However, the manager believes that the pool currently costs £30 per hour to run and therefore wishes to reject this offer. He has asked the Marketing Manager in the Department of Leisure and Amenities to suggest other possible ways of boosting the net income of the pool while, if possible, improving access to the public.

The Marketing Manager has come up with the following suggestions:

Option 1

To extend opening hours to the public, so that the pool is open for the same number of hours on Sunday as on other days (ie from 7am to 10pm). She has done some market research and arrived at the following probabilities for the number of extra customers likely to be attracted per week:

No. of extra customers	Probability
155	.4
170	.3
210	.3

The current charge per swim is £1.20 for adults and 80p for children, and the normal mix of children and adults on Sundays is 60% adults, 40% children. The Marketing Manager's research indicates that this mix would remain the same for the proposed extra hours.

As a result of increasing the opening hours, the caretaker will need to be paid for the extra time that the pool is open at an hourly rate of £5.

Two pool attendants will need to be on duty at a cost of £6 per hour per pool attendant. Extra heat and power costs are estimated at £8.50 per hour, and a receptionist will need to be on duty, at a cost of £8.50 per hour. There would be no extra expenditure on equipment or chemicals.

Option 2

To introduce a reduced charge on two afternoons a week, during term-time, when the pool is not being used by local schools. It is proposed to charge 80p per swim on these afternoons, rather than the current adult rate of £1.20. The current average number of customers per afternoon is 50 (all adults). The Marketing Manager thinks that this would increase demand by 50%, and if the reduction were advertised in the local weekly newspaper, demand would increase in total by 100%.

Meanwhile, the management accountant in the Leisure and Amenities Department has carried out a further analysis of costs relating to the swimming club hire option, and has discovered the following information: If the swimming pool is hired to the swimming club, there is no need for any attendants or a receptionist to be on duty. However, the caretaker will need to be paid extra time for 3 hours at £5 per hour. The wave machine will not be needed during the hire period. The extra heating costs are estimated at £5 per hour.

- **Requirement for question 2**

As the management accountant for the Department of Leisure and Amenities, you have been asked to draft a report on the viability of these options for the Director of Leisure and Amenities, including a detailed financial appraisal of both the Marketing Manager's suggestions, and the option to hire to the swimming club. Your report should include the following:

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|-----|---|----|
| (a) | An explanation of how the swimming pool manager arrived at the cost of £30 per hour and an evaluation of his recommendation to reject the request from the swimming club. | 6 |
| (b) | A financial appraisal of the swimming club hire option, and Option 1, recommending which one should be chosen, giving your reasons. | 12 |
| (c) | The maximum amount which should be spent on advertising Option 2. | 3 |
| (d) | Other factors which should be taken into account when appraising these options, and other pricing policies which could be investigated. | 4 |

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3

Tasteful Limited manufactures three types of garden ornaments: the gnome, the sundial and the birdbath. Details of the variable costs and selling prices are given below:

Type of Ornament	Materials £	Labour £	Selling Price £
Gnome	1.50	1.00	8.00
Sundial	1.50	1.80	10.00
Birdbath	1.00	0.90	9.00

The labour charge is based on the full utilisation of the current labour force of 4 staff, at a standard hourly rate of £6, and a productive working week of 32½ hours per person.

Fixed overheads are absorbed at the rate of 100% of prime cost, and are fully absorbed, based on the current weekly production levels, which are as follows:

Gnome:	420 units
Sundial:	140 units
Birdbath:	120 units

• **Requirement for question 3**

- (a) Calculate the profit per unit for each product type and the total weekly profit. 4
- (b) If one member of staff reports sick for a week, calculate the product mix which would minimise the loss from the reduced capacity, and calculate the effect on overall profit. 9
- (c) The factory consists of four departments, with overheads being incurred by each department in the following proportions:

Moulding	30%
Firing	40%
Finishing	20%
Packing	10%

Production of each type of ornament uses differing amounts of the following activities:

	Gnome	Sundial	Birdbath	Total
no. of set-ups for moulding	40	25	25	90
no. of kiln hours for firing	800	450	490	1,740
no. of finishing hours	10	10	10	30
no. of packing sheets	300	270	300	870

Using this information, and assuming no employee sickness, calculate revised unit cost and unit profit figures for the three products, compare them to the figures calculated in (a) above, and comment on the reasons for, and possible effects of, any differences between the two sets of figures.

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CI Testing plc provides testing services to the construction industry. For the financial year just ending the company expects fixed costs to be £10 million and is forecasting a significant loss.

It is believed that this result is due largely to poor costing and pricing methodologies. The firm's policy is to estimate the full cost of tests using the specified order of closing method for the apportionment of overhead costs.

The firm is divided into three income earning divisions, each of which provides a different kind of test. There are also three overhead departments. The Chief Executive is of the opinion that each division should be treated as an independent business unit which is required to cover its full costs from income and generate a profit. The following information is currently available about each of the divisions and overhead departments.

Division/department	Test A Div. A	Test B Div. B	Test C Div. C	Facilities Mngmnt.	Finance	Personnel & Chief Exec.	Totals
Direct fixed costs (£m)	3.21	2.45	2.30	1.30	0.44	0.30	10.00
Variable costs per test (£)	35	45	55				
Number of tests completed	4,576	3,011	6,841				
Fee charged per test (£)	770	880	380				
Floor area (sq m)	2,670	1,845	2,030	330	180	290	7,345
Number of staff	48	27	66	21	10	4	176

Facilities Management costs are apportioned on the basis of floor area. Finance costs are apportioned on the basis of direct fixed costs, and Personnel/Chief Executive costs are apportioned on the basis of staff numbers.

The company wants to aim for a profit of 5% of turnover in the coming financial year. Costs are expected to remain unchanged. Potentially demand could also be the same but may be affected by price levels as discussed below:

- CI Testing is the only firm which provides test type A locally so price changes (within reason) are not thought likely to affect demand. The national average price for type A tests is £1,200.
- The firm has a regular contract with a major customer to carry out 1,200 tests of type B per year. This activity is included in the figure of 3,011 tests completed as shown above. The contract price for next year has already been agreed at £1 million. There is some local competition for this type of test. Most competitors charge about £1,000 per test.
- The market for type C tests is becoming highly competitive, with local prices ranging from £350 to £375. A market research report has recently been received which

shows that if the fee was left at £380 per test, demand would drop to 6,500 tests; if the price were reduced to £350 demand would increase to 7,000 tests. Demand would start to drop dramatically if the price were to be increased above £380.

- **Requirement for question 4**

- (a) Calculate the unit cost per test for each of the three tests, assuming existing demand levels, using the specified order of closing method for apportioning overhead department costs, and determine the price which must be charged next year for each test to enable each division to achieve the 5% profit margin.

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- (b) Assuming you are an assistant to the Finance Director, prepare a report for the Chief Executive of CI Testing, recommending unit prices for each of the three tests for next year. Your recommendations should be designed to ensure that the overall 5% profit margin is achieved and should take account of current market conditions. You should explain the reasons for your proposals and draw attention to any risks involved. Any calculations should be included in the report.

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Spelton Further Education college has a sophisticated costing system which allocates all college costs to income earning courses.

One course is the HND in Hotel and Catering Management which has recently completed its fifth year. The following information is available about this course:

	Year ending:				
	Aug 95	Aug 96	Aug 97	Aug 98	Aug 99
Actual Full Cost Incurred (£000)	206	213	222	232	229
Number of Students	102	88	90	110	79
Further Education Cost Index	158	167	174	179	183

The market for this course is becoming increasingly volatile and the course manager is unwilling to make a firm forecast of student numbers for the course due to start in September 2000. She believes that numbers could be up to 20% higher or lower than in previous years.

Fixed costs for the course starting in September 2000 are generally expected to be similar to previous years in real terms, with the following exceptions: If the number of students were to rise above 110, additional part time tutors would need to be recruited at an annual cost of £50,000. If numbers fall below 70 some existing part time contracts would not be renewed, resulting in a net annual saving of £30,000. Both figures are based on 1998/99 rates of pay.

In 1998/99 the college received 1998/99 income of £2,400 per year for each student enrolled.

- **Requirement for question 5**

(a) Estimate the variable cost per HND student and the annual fixed cost at 1998/99 prices, based on the 5 years' data given above.

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(b) Prepare a break even chart for the course, using 1998/99 prices.

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(c) As a trainee accountant working in the college, draft a report for the course manager reporting your results and explaining their significance. In the report you should also draw attention to any weaknesses or assumptions in the techniques you have used.

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