Examiner's Report and Model Answers for

Management Accounting

THIRD LEVEL
Series 3 (Code 3023) 2001

Management Accounting Third Level
Series 3 2001

How to use this booklet

Examiners' Reports and Model Answers have been developed by LCCIEB to offer additional information and guidance to Centres, teachers and candidates as they prepare for LCCIEB examinations. The contents of this booklet are divided into 5 elements:

(1)	General	– assessment of overall candidate performance in this examination, providing general guidance where it applies across the examination as a whole
(2)	Questions	– reproduced from the printed examination paper
(3)	Model Answers	– summary of the main points that the Chief Examiner expected to see in the answers to each question in the examination paper
(4)	Examiner's Report	– constructive analysis of candidate error, areas of weakness and other comments that apply to each question in the examination paper
(5)	Helpful Hints	– where appropriate, additional guidance relating to individual questions or to examination technique

Teachers and candidates should find this booklet an invaluable teaching tool and an aid to success.

The London Chamber of Commerce and Industry Examinations Board provides Model Answers to help candidates gain a general understanding of the standard required. The Board accepts that candidates may offer other answers that could be equally valid.

Note

LCCIEB reserves the right not to produce an Examiner's Report, either for an examination paper as a whole or for individual questions, if too few candidates were involved to make an Examiner's Report meaningful.

Management Accounting Third Level
Series 3 20001

GENERAL COMMENTS

The overall performance was slightly disappointing but results varied markedly between centres. Many candidates could answer some questions well but were unable to sustain performance sufficiently over five questions. A good number of other candidates seemed quite unprepared for the examination.

Management Accounting Third Level
Series 3 2001

QUESTION 1

REQUIRED

(a) Outline the merits and limitations of both the accounting rate of return method and also the payback method of capital investment project appraisal.

(6 marks)

(b) Describe and contrast the two main discounted cash flow methods of capital investment project appraisal (ie net present value (NPV) and internal rate of return (IRR)).

(7 marks)

A company has evaluated the worth of two proposed investment projects as follows:

	NPV at 12% (the cost of capital)	NPV at 18%
Project 1	£28,400	(£6,900)
Project 2	£16,800	(£1,200)

REQUIRED

(c) Draw a graph of the above situation. Explain why the NPV and IRR methods may not rank projects in the same order, using your graph as an illustration.

(7 marks)

(Total 20 marks)

Model Answer to Question 1

(a) Merits of both methods:

    (i)   Relatively straightforward to calculate
    (ii)   Relatively easy to understand eg ARR is based on profits and is consistent with ROCE performance measures

    Limitations:

    (i)   Both methods fail to take account of the time value of money
    (ii)   In addition, payback ignores cash flows after the payback period has been reached

(b) NPV requires the discounting of future expected cash flows to present values using the cost of capital % as the discount rate. A positive NPV for an investment project (ie sum of present values of cash inflows > cost of investment) indicates that the project is worthwhile and vice versa.

    IRR requires the determination of the discount rate that produces a zero NPV for a project. The test of profitability is whether the IRR % is greater or less than the cost of capital %. IRR % > cost of capital % indicates that the project is worthwhile and vice versa.

    Both NPV and IRR will result in the same conclusion regarding the viability of an investment project.

Model Answer to Question 1 continued

(c) The impact of a change in discount rate, on the present value of a project, depends upon both the size and the timing of the cash flows. As a consequence, the order of ranking of projects may change as the discount rate is changed. This is illustrated on the graph. At the cost of capital, Project 1 is preferred as the NPV is higher. However, the IRR % of Project 2 is greater (at almost 18%) than that for Project 1 (approx 17%).

NPV £000
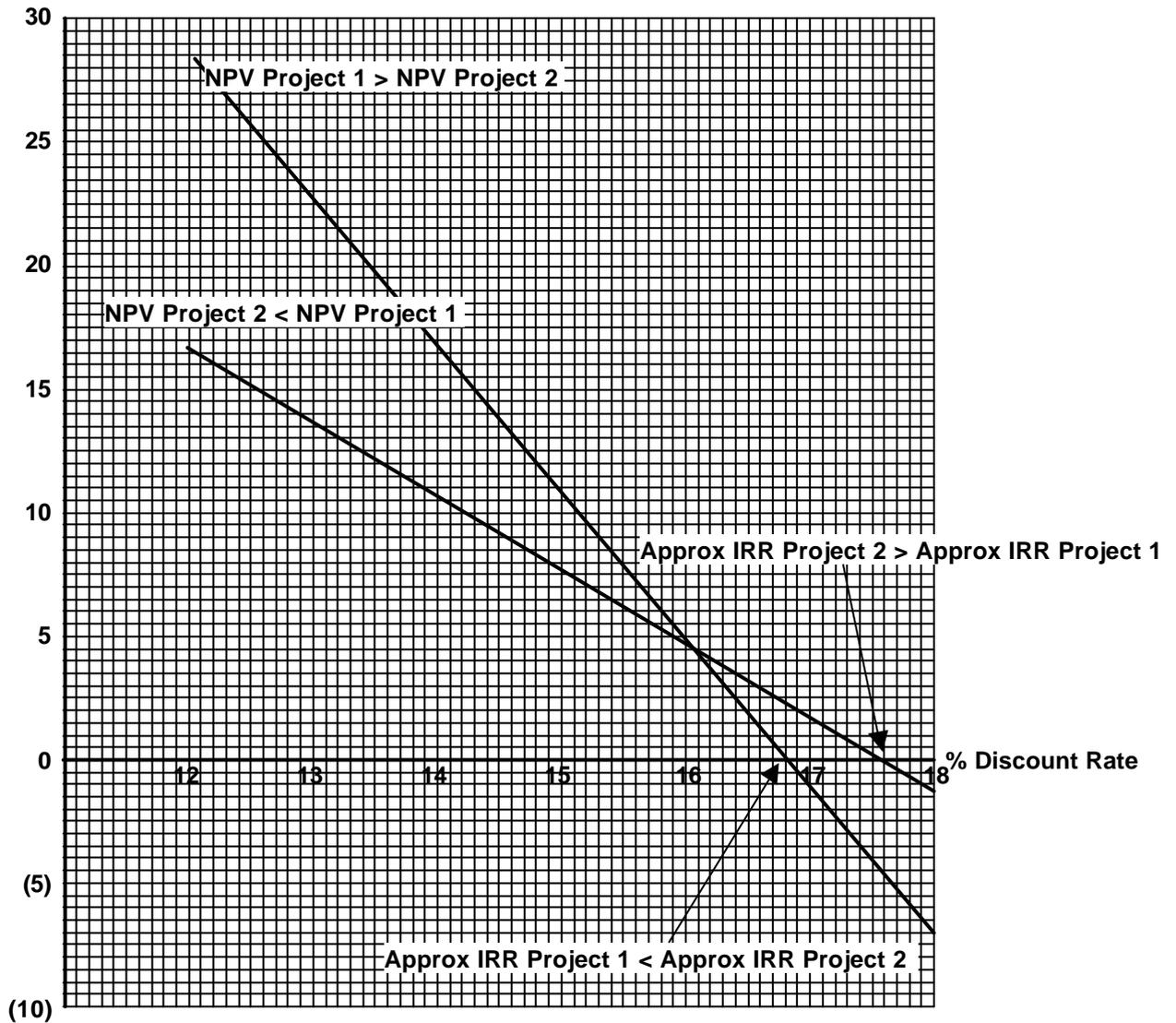
Examiner's Report on Question 1

Question 1 was on the subject of capital investment appraisal methods.

In part (a), most candidates failed to answer the main point of the question ie 'merits and limitations' of the two traditional appraisal methods. Instead they explained/described, sometimes with figures, how each method is operated and calculated.

Part (b) was also frequently answered poorly with very rarely any reference to the cost of capital when describing the NPV method and frequently little more than a formula provided for the IRR.

In part (c), some candidates failed to prepare a graph. Scaling and labelling of graphs was often poor resulting in some meaningless plots and lines. Some candidates noted the difference in ranking but few were able to explain it. Many candidates wasted time by calculating the IRR% for each project.

QUESTION 2

A company will commence operations in September with £150,000 cash at bank, raised from an issue of share capital. A stock of goods costing £45,000 will be purchased in August, with further purchases in the following three months sufficient to increase stock by £5,000 each month. Goods are purchased on one month's credit.

Sales are to be made on credit at a mark-up of 40% on cost. Sales in the first three months of operations, at a selling price of £14 per unit, are expected to be:

September	1,500 units
October	4,500 units
November	5,000 units

50% of customers are expected to pay in the month following sale and the remaining 50% one month later.

Variable overheads are forecast at 5% of sales, payable in the month in which they are incurred. Fixed overheads, excluding depreciation, are expected to be £11,800 per month starting in September. Fixed overheads are payable one month after they are incurred. Depreciation of fixed assets will be £2,000 per month on the capital expenditure of £120,000 that will take place in August. Payment will be made in September.

Interest is payable monthly, at a rate of 12% per annum, on any opening overdraft balances.

REQUIRED

(a) Prepare a cash budget for **each** of the three months, September to November, showing clearly any overdraft required and the associated interest costs.

(13 marks)

(b) Calculate the number of units in stock at the end of November.

(3 marks)

(c) Calculate the profit after interest in November if a marginal costing system is used.

(4 marks)

(Total 20 marks)

Model Answer to Question 2

(a) Cash Budget:

	September	October	November
Receipts:			
Capital	150,000		
Sales	_____	10,500	42,000
	150,000	10,500	42,000
Payments:			
Goods purchased	45,000	20,000	50,000
Variable overheads	1,050	3,150	3,500
Fixed overheads		11,800	11,800
Capital expenditure	120,000		
Overdraft interest	_____	161	407
	166,050	35,111	65,707
Net cash flow	(16,050)	(24,611)	(23,707)
Opening cash balance	---------	(16,050)	(40,661)
Closing cash balance	(16,050)	(40,661)	(64,368)

Workings:

	September	October	November
Sales	21,000	63,000	70,000
Purchases (Sales ÷ 1.4 + 5,000)	20,000	50,000	

(b) Stock = $\dfrac{45,000 + (3 \times 5,000)}{14 \div 1.4}$

    = 6,000 units

(c) Profit in November:

Contribution 5,000 units at £3.30 per unit =	16,500
Less Fixed overheads	13,800
Interest	407
Profit after interest	2,293

Examiner's Report on Question 2

Question 2 was on the subject of cash and profit budgets and, as usual, generally brought reasonable attempts from most candidates.

Common errors in part (a), in the preparation of the cash budget included:

(i)   Marking sales up by 40% on the £14 selling price given
(ii)   Taking the closing stock figures as the purchases without any reference to goods sold
(iii)   Including depreciation as a cash outflow
(iv)   Taking the fixed overheads as including depreciation, rather than excluding it as stated
(v)   Phasing the interest incorrectly and/or calculating it at 12% per month (rather than per year)
(vi)   Calculating the interest on the opening cash balance (positive) of £150,000

In part (b), answers were at times inconsistent with the purchases assumed in part (a). Some candidates calculated the unit cost incorrectly or left their answer in £ total rather than units.

A number of candidates calculated profit, in part (c), for the three months, rather than simply for the month of November as requested. The cost of goods sold was frequently incorrect and depreciation and/or interest were often omitted.

QUESTION 3

The following are the expected production overhead costs for a factory department at three different levels of activity in a period:

	Output (units)		
	16,000	**20,000**	**24,000**
	£	**£**	**£**
Variable costs	14,000	17,500	21,000
Semi-variable costs	12,200	13,000	13,800
Fixed costs	<u>31,000</u>	<u>31,000</u>	<u>31,000</u>
	<u>57,200</u>	<u>61,500</u>	<u>65,800</u>

The total production overhead costs of the department for a period can be calculated using an equation of the form:

$y = a + bx$

where:

y is the total production overhead cost (£)
a is the total fixed production overhead cost (£)
b is the variable production overhead cost (£ per unit of output)
x is the number of units of output.

REQUIRED

(a) Using the above data, calculate the values of *a* and *b*.

(6 marks)

(b) Estimate the total production overhead costs for the department in a period if 18,000 units are manufactured.

(2 marks)

(c) Calculate the predetermined production overhead absorption rate, per unit of output for the department, based on planned production of 20,000 units in a period.

(2 marks)

(d) Using the absorption rate established in (c) above, calculate the over/under absorbed overhead if actual output is 21,500 units and costs are as expected.

(5 marks)

(e) Contrast the way in which production overhead costs are attributed to products using activity based costing (ABC) with the more traditional full absorption costing approach.

(5 marks)

(Total 20 marks)

Model Answer to Question 3

(a)   Linear equation established from high-low analysis as follows:

Variable costs per unit = $\dfrac{65,800 - 57,200}{24,000 - 16,000}$

= £1.075 per unit

Total fixed costs = 65,800 - (24,000 x 1.075)

= £40,000 per period

Equation: $y = 40,000 + 1.075x$

(b) $y = 40,000 + (18,000 \times 1.075)$

= £59,350

(or $\dfrac{57,200 + 61,500}{2}$ = 59,350)

(c)   Absorption rate = 61,500 ÷ 20,000 = £3.075 per unit

(d)   Costs = 40,000 + (21,500 x 1.075) = 63,112.5

Absorption = 21,500 x 3.075 = 66,112.5

Over-absorption = £3,000 (ie 1,500 units x £2.00 per unit fixed overhead)

(e)   Traditional methods allocate or apportion all production overheads to production departments. A variety of bases may be used for apportionment depending upon the main influence on cost occurrence. However, within each production department, the absorption of overhead into product costs is traditionally based on a single measure of output activity (typically labour hours or machine hours). As a consequence, any link with the cause of occurrence of allocated or apportioned costs tends to be lost.

The key difference in ABC systems is that the key drivers of overhead costs are more closely linked with the use that each product makes of those drivers. This is achieved by first collecting overhead costs according to each cost driver in cost pools. The use that products make of each key driver is then measured and used as a basis for linking overhead costs with products. As a consequence, product costs should be more accurate.

Examiner's Report on Question 3

Question 3, on cost behaviour and overhead absorption, frequently produced good answers to parts (a) to (d). Part (e) was generally answered poorly, if at all.

Most candidates were able to apply the high/low method in part (a) although a reasonable number only applied it to the semi-variable costs where the separation of costs into variable/fixed was required ie they failed to include the variable costs and the fixed costs in the equation for total production overhead costs. A number of candidates added the three periods together.

Most candidates were able to estimate total production overhead costs in part (b), using their own equation from part (a), and part (c) presented few problems.

In part (d), much confusion was evident regarding budgeted costs, actual costs and absorbed costs and also regarding which two figures are compared in order to establish the extent of over or under absorption. Candidates also frequently failed to indicate clearly what was being calculated, with numbers appearing with no description. The use of the budgeted costs of £61,500 at 20,000 units was quite common within the calculations.

In part (e), very few answers contained the main contrasting features required and candidates should take particular note of the suggested answer.

QUESTION 4

REQUIRED

(a) Comment on the use of 'full cost plus' and 'marginal cost' as the basis for transfer pricing.

(6 marks)

Company A, one of the divisions within a group of companies, manufactures a component for Company B, another division within the group. In the next period, Company B anticipates a requirement for 10,000 units of the component. The component is currently purchased from Company A at a transfer price based on full cost.

At the expected level of demand, the costs of Company A supplying the component to Company B in the next period are expected to be:

Variable costs	£3.70 per unit
Fixed costs	£18,000 for the period.

Company A would like to change the basis for the calculation of the transfer price of the component in order to make a profit. However, an increase in the transfer price is being resisted by Company B, especially as the component is also available from a supplier outside the group at a cost price of £5.20 per unit.

REQUIRED

(b) Calculate the transfer price for the component for the next period if based on full cost.

(3 marks)

(c) Calculate whether the group would gain or lose in the period if Company B purchased the component entirely from the outside supplier.

(5 marks)

Assume that purchase of the component, by Company B, entirely from the outside supplier would release capacity in Company A. This surplus capacity could be used to generate a contribution of £20,000 in the period on another component.

REQUIRED

(d) Determine the effect on group profit, and the effect on the profit of each of the two divisions, in these circumstances.

(6 marks)

(Total 20 marks)

Model Answer to Question 4

(a) 'Full cost plus' and 'marginal cost' are examples of cost based, as opposed to market based, transfer pricing. A general limitation of cost based methods is that they do not encourage efficiency in the selling centre because the centre is able to pass on all costs incurred to the buying centre.

Full cost plus may be used as the basis for transfer pricing where both buying and selling centres are treated as either profit or investment centres, and where market based transfer prices are not available. The transfer price will change from time to time if activity changes, due to the existence of fixed costs. Also, the seller's fixed costs become the buyer's variable costs leading potentially to sub-optimal decisions for the company as a whole.

This latter limitation is overcome if marginal (variable) costs are used as the basis for transfer pricing, but this method leads to an inequitable distribution of costs and revenues between buyer and seller, and lack of motivation in the selling centre. There is a danger also that long-term variable costs (short-term fixed costs) are largely ignored.

(b) Transfer price =   3.70
            + 1.80 (£18,000 ÷ 10,000 units)
            £5.50 per unit

(c) Short-term:

Variable cost   3.70
Outside price   5.20
Group loss   £1.50 per unit x 10,000 units = £15,000 for the period

Longer term, however, it calls into question whether Company A can produce the component efficiently.

(d) The group would <u>benefit</u> by £5,000 (£20,000 additional contribution - £15,000 additional cost)

Company A:

Existing contribution of £18,000 (ie fixed costs)
Replaced by contribution of £20,000
Net <u>gain £2,000</u>

Company B:

Transfer price   £5.50 per unit
Outside supplier   £5.20 per unit
Net <u>gain</u>   £0.30 per unit x 10,000 units = £3,000

Examiner's Report on Question 4

This question was on the subject of transfer pricing and the implications for a group company and its divisions.

In part (a), very little 'comment' was provided by candidates. Most answers were restricted to a description of what 'full cost plus' and 'marginal cost' mean. Only a minority knew the implications of each basis for the buying and selling divisions, particularly the motivational aspects.

Part (b) presented few problems with answers accepted as a total of £55,000 as well as £5.50 per unit.

In part (c), many candidates answered it from the point of view of Company B. The question clearly instructed candidates to calculate whether the **group** would gain or lose in the period.

In part (d), a minority of candidates were able to determine the effect of the additional contribution in Company A on the profitability of that division and on the profitability of Company B and the group also.

QUESTION 5

A company with a target return on capital employed (ROCE) of 20% per annum is considering the launch of a new product.

Costs of the new product are estimated as follows:

Variable costs per unit   £11.00
Fixed costs per annum   £600,000

Estimates of annual demand for the new product, and the related requirement for working capital investment, are:

	Sales units	Working capital £
Minimum	75,000	170,000
Most likely	100,000	210,000
Maximum	120,000	245,000

The total capital employed at annual demand of 100,000 units would be £865,000.

REQUIRED

(a) Calculate the selling price required, at the maximum level of demand, in order to achieve the target annual ROCE.

(7 marks)

(b) Calculate the annual ROCE if the most likely sales could be achieved at a selling price of £19 per unit.

(4 marks)

(c) Calculate the sales revenue required, at a selling price of £20.00 per unit, in order to achieve an annual profit before interest of £210,000.

(5 marks)

(d) Describe how the range of estimates of annual demand, with a probability attached to each estimate, may be used to help decide whether to launch the new product.

(4 marks)

(Total 20 marks)

Model Answer to Question 5

(a) At maximum level of demand:

Capital employed = £900,000 (865,000 + 35,000)
        x 20% = £180,000 required profit

Required contribution = £780,000 (180,000 + 600,000)
        ÷ 120,000 units = £6.50 required contribution per unit

Selling price = £17.50 per unit (variable costs £11.00 + contribution £6.50)

(b) Contribution per unit = £8.00 (19.00 - 11.00)
        x 100,000 units = £800,000
        less fixed costs   £600,000
        Profit   £200,000

Annual ROCE =   200,000 x 100% = 23.1%
                865,000

(c) Required contribution = £810,000 (210,000 + 600,000)

Contribution per unit = £9.00 (20.00 - 11.00)

Required sales units = 810,000 ÷ 9.00 = 90,000 units

                            x 20.00 = £1.8m sales revenue

(d) The estimates of annual demand, combined with the probability of each estimate occurring, can be used to determine the expected value of annual sales, and thus the expected profit/loss that would result from the launch of the new product.

Each demand estimate can also be used separately to determine the range of profit that could result from the new product launch.

Examiner's Report on Question 5

Question 5 required candidates to apply cost-volume-profit analysis to a situation including fixed and working capital and a target return on total capital employed. Good attempts were frequently made to parts (a) to (c). Part (d) was often answered poorly, if at all.

In part (a), calculation of the total capital employed (capital employed at 100,000 units plus the increase in working capital) proved the hardest task. A variety of attempts were made. Most candidates dealt correctly with the other aspects of this part, although a number used 100,000 (rather than 120,000) units.

Many correct answers were provided to both parts (b) and (c). In part (b), a number of candidates increased the £865,000 (stated clearly in the question to be the **total** capital employed) by the £210,000 working capital, or calculated the profit on maximum (rather than most likely) sales. Some candidates included only the working capital, which was often consistent with their approach to part (a).

In part (c), a significant number of candidates left their answer as 90,000 units. The question asked for the sales revenue required. A number of candidates used the ratio of variable costs to sales, rather than contribution to sales.

In part (d), very few candidates described the calculation of expected value, or the use of the range of possible outcomes, to assist in the decision.

QUESTION 6

REQUIRED

(a) Explain the term **limiting factor** and its significance to a business.

(3 marks)

A company manufactures three products. Selling prices and costs of the three products are as follows:

	Product A £/unit	Product B £/unit	Product C £/unit
Selling price	4.80	5.50	7.40
Costs:			
Direct materials	1.40	1.95	2.42
Direct labour	1.20	1.20	1.80
Overheads	1.80	1.80	2.70

Fixed overheads total £49,000 per period. Overhead absorption, using direct labour hours, is based upon the following production and sales volumes per period which reflect current sales demand:

Product A   8,000 units
Product B   12,000 units
Product C   10,000 units

The company is currently experiencing a shortage of direct labour and estimates that availability will be restricted to 6,200 hours per period. All direct employees are currently paid at a rate of £6.00 per hour.

REQUIRED

(b) Make appropriate calculations to show that the availability of direct labour is currently a limiting factor.

(4 marks)

(c) Determine how the available direct labour resource should be allocated to each of the products in order to maximise profit in a period.

(9 marks)

It is anticipated that an increase in the labour rate of £1.00 per hour would overcome the current shortage of direct labour supply.

REQUIRED

(d) Advise whether an increase in the labour rate of £1.00 per hour would be likely to result in increased profit, compared with the situation in (c) above.

(4 marks)

(Total 20 marks)

Model Answer to Question 6

(a) The term **limiting factor** is used to indicate the aspect of a business that most restricts the business' level of activity for that business. The limiting factor may be customer demand but may alternatively be one of the input resources used by the business (eg labour). It must be determined at the outset of the business planning process because all planned activities will be influenced by it.

(b) Direct labour hours per period:

	Product A	Product B	Product C
Direct labour hours per unit	1.20 / 6	1.20 / 6	1.80 / 6
	= 0.2	= 0.2	= 0.3
x demand per period (units)	8,000	12,000	10,000
= total direct labour hours	1,600	2,400	3,000

Combined total = 7,000 direct labour hours required to satisfy demand per period. Therefore, the available 6,200 direct labour hours per period is a limiting factor.

(c) Fixed overhead absorption rate = 49,000 ÷ 7,000 = £7.00 per direct labour hour.

Product fixed overhead = Product A £1.40 per unit (0.2 x 7)
Product B £1.40 per unit (0.2 x 7)
Product C £2.10 per unit (0.3 x 7)
Therefore

Product variable overhead = Product A £0.40 per unit (1.80 - 1.40)
Product B £0.40 per unit (1.80 - 1.40)
Product C £0.60 per unit (2.70 - 2.10)

Allocation of labour resource:

	Product A	Product B	Product C
Selling price (£/unit)	4.80	5.50	7.40
Variable costs (£/unit)	3.00	3.55	4.82
Contribution (£/unit)	1.80	1.95	2.58
÷ direct labour hours per unit	0.2	0.2	0.3
Contribution per labour hour	9.0	9.75	8.6
Priority			
Allocation of labour hours	1,600	2,400	2,200
			(6,200 - 4,000)

(d) Increased cost = 7,000 hours at £1.00 per hour = £7,000

Increased contribution (before labour cost increase) = 800 additional hours at £8.60 per hour
(Product C)   = £6,880

Profit would be reduced by £120 in the period.

Examiner's Report on Question 6

Question 6 was a limiting factor problem.

In part (a), the majority of candidates were able to explain the term 'limiting factor' but rather fewer considered its significance. A reasonable number of candidates made no attempt to show that the demand for labour exceeded 6,200 hours per period. This was requested in part (b) for 4 marks.

In part (c), a very common error was the failure to separate overheads into variable and fixed components. Occasionally the overheads were assumed to be entirely fixed but the vast majority of candidates took them to be proportionately variable costs, presumably because of the reference to fixed overheads below the table of figures.

Beyond that, most candidates were able to calculate the contribution (based on their own figures for overheads) in relation to the limiting factor and then to go on to allocate correctly (on own figures) the available direct labour resource to complete their answer to part (c).

Good answers to part (d) were relatively rare. Many candidates ignored the fact that the increase in labour rate would overcome the current shortage. They thus failed to recognise the full implications for labour costs and more particularly the additional output that would be enabled.