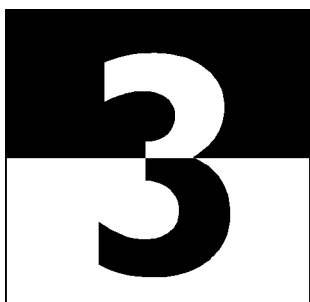


Management Accounting



Level 3

Series 4 2002

(Code 3023)

Model Answers

Management Accounting Level 3

Series 4 2002

How to use this booklet

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 3 elements:

- (1) Questions – reproduced from the printed examination paper
- (2) Model Answers – summary of the main points that the Chief Examiner expected to see in the answers to each question in the examination paper, plus a fully worked example or sample answer (where applicable)
- (3) 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.

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Management Accounting Level 3 Series 4 2002

QUESTION 1

REQUIRED

(a) Define:

- (i) Cost centre
- (ii) Profit centre
- (iii) Investment centre.

(6 marks)

(b) A pyramid of ratios, starting with **three** key financial performance measures, may be used to evaluate investment centres. State the:

- (i) name of **each** of the **three** key financial performance measures
- (ii) formula by which **each** is calculated
- (iii) link between the **three** measures.

(7 marks)

(c) Suggest **three** measures (**either** financial or non-financial) which may be used to evaluate the performance of a hospital that is operated as a non-profit making organisation.

(7 marks)

(Total 20 marks)

Model Answer to Question 1

- (a) (i) A Cost centre is 'a production or service location, function, activity or item of equipment for which costs are accumulated' (CIMA Official Terminology) and used to measure performance.
- (ii) A Profit centre is 'a part of a business accountable for both costs and revenues' (CIMA Official Terminology) where performance, therefore, is measured by the profit generated.
- (iii) An Investment centre is 'a profit centre with additional responsibilities for capital investment and possibly for financing, and whose performance is measured by its return on investment'. (CIMA Official Terminology)

- (b) (i) and (ii) Key financial performance measures:

Primary ratio - Return on capital employed $[(\text{profit} \div \text{capital employed}) \times 100\%]$

Secondary ratios - Profit margin $[(\text{profit} \div \text{sales}) \times 100\%]$

- Asset turnover $[\text{sales} \div \text{capital employed}]$

(iii)
$$\frac{\text{Profit}}{\text{Capital employed}} = \frac{\text{Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Capital employed}}$$

- (c) Financial measures:

- Cost per patient treated $(\text{cost} \div \text{number of patients})$
- Cost per patient/day $(\text{cost per patient treated} \div \text{total patient days})$

Non-financial measures:

- Bed occupancy % $[(\text{number of beds occupied} \div \text{total number of beds}) \times 100\%]$
- Patient waiting time $(\text{total waiting time by patients for treatment} \div \text{number of patients waiting})$.

NB The above measures may be applied separately to in-patients and out-patients and to each separate area of the hospital and/or each type of treatment.

QUESTION 2

A factory has a normal working week of 40 hours which is treated as standard for budgeting purposes with no allowance for lost time. Each direct operative works, where necessary, across different cost centres to suit fluctuating work requirements. The standard hourly wage rate is £7.00 per hour.

In the week just ended:

- (1) In Cost Centre A, the capacity ratio (actual hours as a percentage of budget hours) was 75%. 13 direct operatives were employed with no overtime. One of the operatives was absent through sickness for 10 hours. No hours were lost due to any other cause.
- (2) In Cost Centre B, 20 direct operatives were employed. A total of 100 overtime hours were worked in addition to normal hours. No hours were lost due to sickness or any other cause. This compares with a budget of 18 direct operatives working normal hours. The output achieved was equivalent to 875 standard direct labour hours.

REQUIRED

- (a) Calculate for the week just ended:
 - (i) the total budgeted direct labour hours and the budgeted number of direct operatives in Cost Centre A, based on **each** operative working a 40 hour week with no lost hours (6 marks)
 - (ii) the total budgeted direct labour hours, and the capacity ratio achieved, in Cost Centre B (6 marks)
 - (iii) the efficiency ratio and the production volume ratio in Cost Centre B. (6 marks)
- (b) Demonstrate the relationship between the **three** ratios calculated in (a) above for Cost Centre B. (2 marks)

(Total 20 marks)

Model Answer to Question 2

(a) (i) Cost Centre A:

$$\begin{array}{r} 13 \text{ operatives} \times 40 \text{ hours} = 520 \text{ hours} \\ - \text{ sickness} \quad \quad \quad \underline{10 \text{ hours}} \\ \hline 510 \text{ actual direct labour hours} \end{array}$$

$$\begin{array}{r} \div \text{ capacity ratio } 0.75 \quad = \underline{680 \text{ budgeted direct labour hours}} \\ \div 40 \text{ hours/operative} \quad = \underline{17 \text{ budgeted direct operatives}} \end{array}$$

(ii) Cost Centre B:

$$18 \text{ operatives} \times 40 \text{ hours} = \underline{720 \text{ budgeted direct labour hours}}$$

$$\begin{array}{r} 20 \text{ operatives} \times 40 \text{ hours} = 800 \text{ hours} \\ + \text{ overtime} \quad \quad \quad \underline{100 \text{ hours}} \\ \hline 900 \text{ actual direct labour hours} \end{array}$$

$$\text{Capacity ratio} = \frac{\text{Actual direct labour hours}}{\text{Budgeted direct labour hours}}$$

$$= 900 \div 720 = \underline{1.25} \text{ (or 125\%)}$$

(iii) Cost Centre B:

$$\text{Efficiency ratio} = \frac{\text{Standard direct labour hours of output}}{\text{Actual direct labour hours}}$$

$$= 875 \div 900 = \underline{0.972} \text{ (or 97.2\%)}$$

$$\text{Production volume ratio} = \frac{\text{Standard direct labour hours of output}}{\text{Budgeted direct labour hours}}$$

$$= 875 \div 720 = \underline{1.21527} \text{ (or 121.5\%)}$$

(b) Relationship between the 3 ratios

$$\text{Production volume} = \text{Capacity} \times \text{Efficiency}$$

$$\text{ie } 1.21527 = 1.25 \times 0.972$$

QUESTION 3

Material XX is used in all four products manufactured by a company. Availability of Material XX, which costs £8.00 per kg, is restricted to 4,000 kg per month until further notice.

Details of selling prices and unit costs of **each** of the **four** products are as follows:

	Product A	Product B	Product C	Product D
	£/unit	£/unit	£/unit	£/unit
Selling price	4.60	5.00	7.00	7.50
Costs:				
Material XX	0.40	0.80	0.80	1.40
Other direct materials	1.00	1.15	1.60	1.80
Direct wages (£6.00 per hour)	1.20	1.20	1.80	1.80
Overheads	1.50	1.50	2.25	2.25

Fixed overheads total £600,000 per annum. Overhead absorption, using direct labour hours, is based upon the following current monthly sales demand for the products:

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

REQUIRED

- (a) Determine the quantity of **each** product that should be manufactured per month in order to maximise profit. (15 marks)
- (b) Calculate the maximum monthly profit. (5 marks)

(Total 20 marks)

Model Answer to Question 3

(a) Calculation of variable overheads per unit:

Total overheads per month = overheads per unit x monthly demand

= Product A	£12,000	(1.50 x 8,000)
Product B	£18,000	(1.50 x 12,000)
Product C	£22,500	(2.25 x 10,000)
Product D	<u>£22,500</u>	(2.25 x 10,000)
	<u>£75,000</u>	

Fixed overheads per month = £50,000

Therefore variable overheads per month = £25,000 (33.3% of the total)

Therefore variable overheads per unit =

Product A	£0.50	(1.50 ÷ 3)
Product B	£0.50	(1.50 ÷ 3)
Product C	£0.75	(2.25 ÷ 3)
Product D	£0.75	(2.25 ÷ 3)

OR

Direct labour hours per month = hours per unit x monthly demand

= Product A	1,600	(1.20/6.00 x 8,000)
Product B	2,400	(1.20/6.00 x 12,000)
Product C	3,000	(1.80/6.00 x 10,000)
Product D	<u>3,000</u>	(1.80/6.00 x 10,000)
	<u>10,000</u>	

Fixed overheads per month = £50,000 = £5.00 per direct labour hour (50,000 ÷ 10,000)

Variable overheads per unit = total overheads per unit – fixed overheads per unit

= Product A	1.50 – 1.00	(5.00 x 1.20/6.00) = £0.50
Product B	1.50 – 1.00	(5.00 x 1.20/6.00) = £0.50
Product C	2.25 – 1.50	(5.00 x 1.80/6.00) = £0.75
Product D	2.25 – 1.50	(5.00 x 1.80/6.00) = £0.75

Calculation of the contribution per kg of Material XX:

	Product A	Product B	Product C	Product D
Total variable costs/unit	3.10	3.65	4.95	5.75
Contribution/unit	1.50	1.35	2.05	1.75
Kg of Material XX/unit	0.05	0.10	0.10	0.175
Contribution/kg of Material XX	30.00	13.50	20.50	10.00
Production ranking	1	3	2	4

Allocation of Material XX:

Available per month	<u>4,000 kg</u>	
Product A	400 kg = <u>8,000</u> units manufactured	
Product C	1,000 kg = <u>10,000</u> units manufactured	
Product B	1,200 kg = <u>12,000</u> units manufactured	
Product D	<u>1,400 kg</u> = <u>8,000</u> units manufactured	
	<u>4,000 kg</u>	

Model Answer to Question 3 continued

(b) Maximum monthly profit:

Contribution:

	£		Kg	x	Contribution per Kg	£
Product A	12,000	(8,000 units @ £1.50)	or	400	£30.00	12,000
Product B	16,200	(12,000 units @ £1.35)	or	1,200	£13.50	16,200
Product C	20,500	(10,000 units @ £2.05)	or	1,000	£20.50	20,500
Product D	<u>14,000</u>	(8,000 units @ £1.75)	or	1,400	£10.00	<u>14,000</u>
	<u>62,700</u>					<u>62,700</u>
less Fixed o'hds	<u>50,000</u>					
Profit	<u>12,700</u>					

QUESTION 4

A company buys and sells a single product. Profit budgets (by month) for the 6 month period from January 2003 are:

	January £	February £	March £	April £	May £	June £
Sales	160,000	170,000	180,000	180,000	160,000	150,000
Cost of sales	<u>88,000</u>	<u>93,500</u>	<u>99,000</u>	<u>99,000</u>	<u>88,000</u>	<u>82,500</u>
Gross profit	72,000	76,500	81,000	81,000	72,000	67,500
Wages	34,000	34,000	34,000	34,000	34,000	34,000
Other costs	<u>34,800</u>	<u>35,400</u>	<u>36,000</u>	<u>36,000</u>	<u>34,800</u>	<u>34,200</u>
Net profit/(loss)	<u>3,200</u>	<u>7,100</u>	<u>11,000</u>	<u>11,000</u>	<u>3,200</u>	<u>(700)</u>

Notes:

- (1) 10% of the sales are for cash; credit sales are paid for in the month after sale.
- (2) Purchases of the product are paid for in the month following purchase.
- (3) Stock of the product (at cost) is expected to be:

	£
End January 2003	46,750
End February 2003	49,500
End March 2003	49,500
End April 2003	44,000
End May 2003	41,250
End June 2003	43,000.

- (4) Wages are paid in the month incurred.
- (5) Depreciation of £6,000 per month is included in 'other costs'. Other costs (except depreciation) are paid in the month following that in which they are incurred.
- (6) Capital expenditure of £45,000 is forecast in May 2003.
- (7) Balances of current asset/liability items, at the end of December 2002, are expected to be:

	£
Stock	44,000
Debtors	135,000
Bank	10,600 overdrawn
Creditors	113,450

- (8) A positive cash balance of £11,750 is forecast for end March 2003.

REQUIRED

- (a) Prepare a cash budget for **each** of the months **April, May** and **June 2003**. (12 marks)
- (b) Prepare a schedule itemising the net current assets expected at **31 May 2003**. (4 marks)
- (c) Calculate the following ratios based on the expected current assets/liabilities at **31 December 2002**:
 - (i) Current
 - (ii) Acid Test (Quick). (4 marks)

(Total 20 marks)

Model Answer to Question 4

(a) Cash budget (April - June 2003):

	April £000	May £000	June £000
Receipts from sales:			
Cash sales	18	16	15
Credit sales	<u>162</u>	<u>162</u>	<u>144</u>
	180	178	159
Payments:			
Product*	99	93.5	85.25
Wages	34	34	34
Other costs	30	30	28.8
Capital expenditure	<u> </u>	<u>45</u>	<u> </u>
	163	202.5	148.05
Net cash flow	17	(24.5)	10.95
Opening cash balance	11.75	28.75	4.25
Closing cash balance	<u>28.75</u>	<u>4.25</u>	<u>15.20</u>

Workings

(i) Receipts from sales:

	Jan	Feb	Mar	Apr	May	June
Sales (£000)	160	170	180	180	160	150
Cash Sales 10%	16	17	18	18	16	15
Credit Sales	144	153	162	162	144	135

Customers allowed 1 month's credit ∴

Receipts (£000) Cash Budget	April	May	June
Cash Sales	18	16	15
From Debtors	<u>162</u>	<u>162</u>	<u>144</u>
TOTAL	<u>180</u>	<u>178</u>	<u>159</u>

(ii) Payments for product:

Opening stock + purchases – closing stock = Cost of Sales

∴ Purchases = Cost of Sales + Closing Stock – Opening Stock

OR Purchases = Cost of Sales ± Stock Difference

∴ £000	March	April	May	June
Cost of Sales	99.00	99.00	88.00	82.50
+ Closing Stock	<u>49.50</u>	<u>44.00</u>	<u>41.25</u>	<u>43.00</u>
	148.50	143.00	129.25	125.50
– Opening Stock	<u>49.50</u>	<u>49.50</u>	<u>44.00</u>	<u>41.25</u>
Purchases	<u>99.00</u>	<u>93.50</u>	<u>85.25</u>	<u>84.25</u>
OR	99.00	99.00	88.00	82.50
Stock Difference	<u>NIL</u>	<u>(5.50)</u>	<u>(2.75)</u>	<u>1.75</u>
Purchases	<u>99.00</u>	<u>93.50</u>	<u>85.25</u>	<u>84.25</u>

Suppliers allow 1 month's credit

∴ Cash Budget	April	May	June
Payments to creditors	99.00	93.50	85.25

Model Answer to Question 4 continued

(b) Net current assets (at 31 May 2003):

Current assets:	£	
Stock	41,250	
Debtors	144,000	
Cash	<u>4,250</u>	
	189,500	
Current liabilities:		
Creditors	<u>£114,050</u>	(£85,250 + £28,800)
	<u>£75,450</u>	

(c) (i) Current ratio = $179,000 : 124,050 = \underline{1.443 : 1}$

(ii) Acid Test ratio = $135,000 : 124,050 = \underline{1.088 : 1}$

QUESTION 5

A company is considering investment in a project to enable the manufacture and launch of a new product. The investment, all payable at the start of the project, would be £960,000. The project would have a life of 8 years with no terminal value. Annual profit (after depreciation) from the project is estimated to be £115,000.

Present value of £1:

Discount Rate	Year								Annuity for 8 years
	1	2	3	4	5	6	7	8	
8%	0.926	0.857	0.794	0.735	0.681	0.630	0.583	0.540	5.747
14%	0.877	0.769	0.675	0.592	0.519	0.456	0.400	0.351	4.639
20%	0.833	0.694	0.579	0.482	0.402	0.335	0.279	0.233	3.837

REQUIRED

(a) Calculate, in relation to the investment project:

- (i) the payback period
- (ii) the accounting rate of return on the average investment.

(9 marks)

(b) Calculate, in relation to the investment project:

- (i) the net present value at a discount rate of 14%
- (ii) the internal rate of return (to the nearest %).

(7 marks)

(c) Explain the term **sensitivity analysis** in the context of long-term decision-making.

(4 marks)

(Total 20 marks)

Model Answer to Question 5

$$\begin{aligned}\text{Annual cash inflow} &= \text{£}115,000 + \text{depreciation} \\ &= \text{£}115,000 + (960,000 \div 8) \\ &= \text{£}235,000\end{aligned}$$

$$(a) \quad (i) \quad \text{Payback period} = \frac{960,000}{235,000} = \underline{4.1 \text{ years}}$$

$$(ii) \quad \text{Accounting rate of return} = \frac{115,000}{960,000 \div 2} \times 100\% = \underline{24\%}$$

$$(b) \quad (i) \quad \text{NPV @ 14\%} = (235,000 \times 4.639) - 960,000 = \underline{\text{£}130,165}$$

$$(ii) \quad \text{NPV @ 20\%} = (235,000 \times 3.837) - 960,000 = (\text{£}58,305)$$

$$\begin{aligned}\text{Approx IRR\%} &= 14 + [(20 - 14) \times \frac{130,165}{130,165 + 58,305}] \\ &= \underline{18\%}\end{aligned}$$

- (c) Sensitivity analysis is sometimes referred to as 'what if' analysis. It seeks to assess the effect that changes in each of the variables in an investment project will have on the overall return. For example, questions such as 'what will be the effect on project profitability if sales are 10% below best estimates?'

Alternatively, the level of, for example, sales at which the project breaks even could be calculated (again other variables remaining as forecast).

In this way an assessment can be made of the key variables in a project and the impact that differences in outcome may have on a project's viability. A more informed decision can be taken on the basis of the sensitivity analysis.

QUESTION 6

A company that manufactures and sells **two** products (A and B), operates an absorption costing system. Production overheads are absorbed at a pre-determined rate based on direct labour hours.

Budgeted unit selling price and costs, for **each** product for a period, were as follows:

	Product A £/unit	Product B £/unit
Selling price	16.00	22.00
Direct materials	5.00	6.50
Direct labour (£8.00 per hour)	4.00	6.00
Production overhead	3.00	4.50

Production quantities in the period were:

	Budget	Actual
Product A (units)	21,000	22,000
Product B (units)	15,000	14,500

Actual sales in the period were:

Product A	£348,800 (21,800 units)
Product B	£321,200 (14,600 units)

Opening and closing stocks of the two products are valued at the above budgeted unit costs. Actual expenditure in the period on prime costs (per unit of product) was as per budget, as were the actual direct labour hours per unit. Total production overheads incurred in the period were £132,265.

REQUIRED

- (a) Calculate for the period:
- (i) the total budgeted production overheads
 - (ii) the pre-determined production overhead absorption rate per direct labour hour. (5 marks)
- (b) Prepare a profit statement for the period showing details of sales, costs and gross profit for **each** product and in total. (10 marks)
- (c) Outline possible reasons for over- or under-absorption of production overheads, both in general and also with specific reference to the situation above. (5 marks)

(Total 20 marks)

Model Answer to Question 6

(a) (i) Budgeted production overheads:

Product A	£63,000	(21,000 units @ £3.00)
Product B	<u>£67,500</u>	(15,000 units @ £4.50)
	<u>£130,500</u>	

(ii) Pre-determined production overhead absorption rate:

Budgeted direct labour hours:

Product A	10,500	hours (21,000 units x 0.5 hours/unit)
Product B	11,250	hours (15,000 units x 0.75 hours/unit)
	<u>21,750</u>	hours

£130,500 ÷ 21,750 direct labour hours = £6.00 per direct labour hour

OR

From observation of the unit costs given:

Product A has production o'hd of £3.00 for 0.5 direct labour hours
and/or Product B has production o'hd of £4.50 for 0.75 direct labour hours

Therefore pre-determined production overhead absorption rate
= £6.00 per direct labour hour

(b) Profit statement:

	Product A	Product B	Total
	£	£	£
Sales	348,800	321,200	670,000
Cost of sales	<u>261,600</u>	<u>248,200</u>	<u>509,800</u>
Gross profit before adjustment	<u>87,200</u>	<u>73,000</u>	160,200
Under-absorbed production overheads			<u>(1,015)</u> - see below
Gross profit after adjustment			<u>159,185</u>

Working:

Direct labour hours worked:

Product A	11,000	hours (22,000 units x 0.5 hours/unit)
Product B	<u>10,875</u>	hours (14,500 units x 0.75 hours/unit)
	<u>21,875</u>	hours

Production overhead absorbed = 21,875 hours @ £6.00 = £131,250
Less actual production overheads incurred £132,265
= Production overheads under-absorbed £1,015

(c) Over- or underabsorption of production overheads can occur for 2 principal reasons:

- (i) activity >> budget
- (ii) expenditure >> budget.

In the specific situation above, activity (21,875 direct labour hours) is greater than budget (21,750 direct labour hours) leading to £750 more overheads than budget being absorbed (125 direct labour hours @ £6.00). However this is more than offset by increased expenditure over budget and thus, overall, underabsorption of production overhead occurs.

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