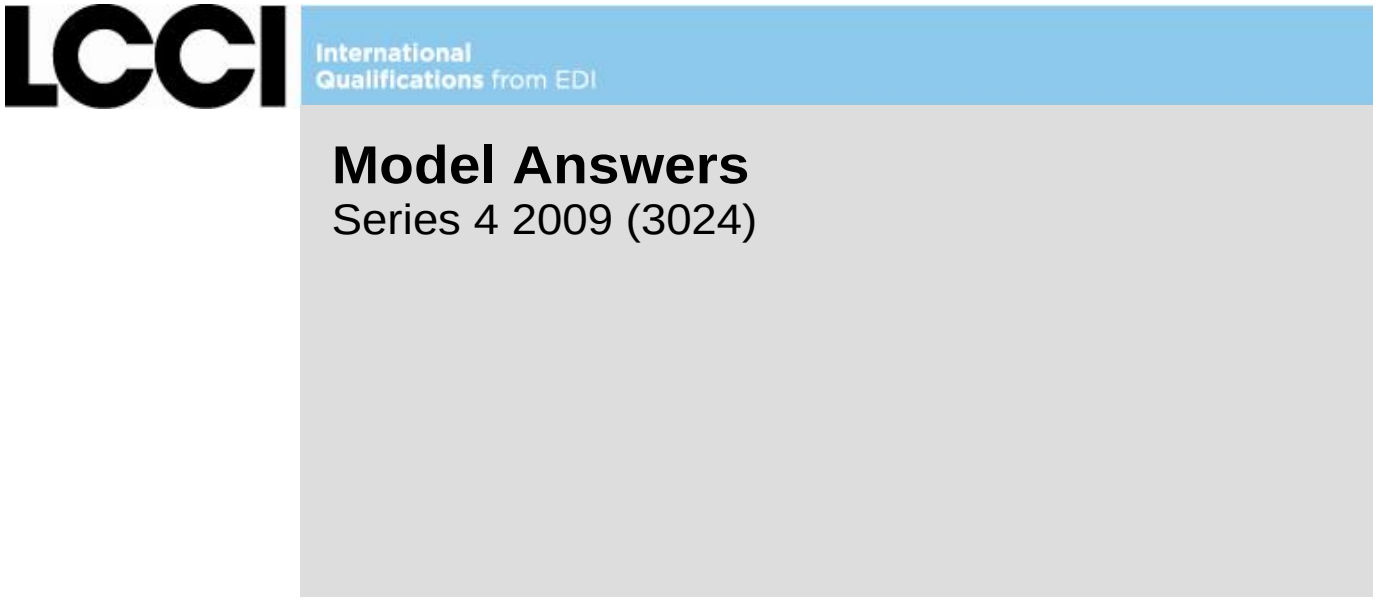
Management Accounting
Level 3



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Management Accounting Level 3
Series 4 2009

How to use this booklet

Model Answers have been developed by EDI to offer additional information and guidance to Centres, teachers and candidates as they prepare for LCCI International Qualifications. 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.

EDI provides Model Answers to help candidates gain a general understanding of the standard required. The general standard of model answers is one that would achieve a Distinction grade. EDI accepts that candidates may offer other answers that could be equally valid.

QUESTION 1

A company manufactures and sells two products using three different types of machines. The following details are available for the coming period:

	Product X Per unit	**Product Y** Per unit
Selling price	£75	£100
Variable costs	£35	£40
Machine hours:		
Machine A	2 hours	1 hour
Machine B	1 hour	2 hours
Machine C	1 hour	1 hour

The maximum machine hours available for production in the coming period are estimated as follows:

	Hours
Machine A	1,800
Machine B	1,600
Machine C	1,000

The company wishes to determine a production plan which will maximise its contribution for the coming period. All units produced are expected to be sold in the coming period.

REQUIRED

(a) Formulate the problem presented above as a linear programme.

(5 marks)

(b) Draw a graph for the linear programming problem formulated in part (a), clearly indicating the binding constraints and the feasible area for a solution.

(9 marks)

(c) Reading from the graph drawn in part (b), list the production plans in units of Product X and Product Y that are attainable at the corner points of the feasible area of solution.

(4 marks)

(d) State which one of the production plans listed in part (c) will maximise the company's contribution for the coming period and calculate the total amount of this contribution.

(2 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 1

(a) The decision variables and the objective function of the linear programming (LP) model are represented by the following symbols:

X = units of Product X to be produced and sold.

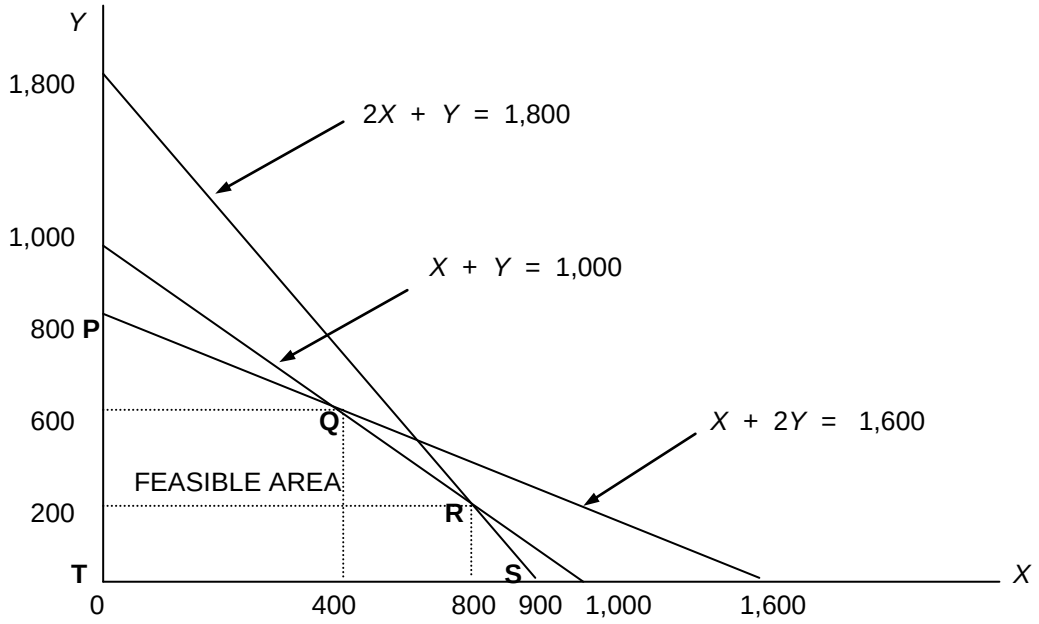
Y = units of Product Y to be produced and sold.

C = value of total contribution for the period.

The LP model is formulated as follows:

Maximise	C = 40X + 60Y	(objective function)
Subject to:	2X + Y $\leq$ 1,800	(hours available on Machine A)
	X + 2Y $\leq$ 1,600	(hours available on Machine B)
	X + Y $\leq$ 1,000	(hours available on Machine C)
and	X ≥ 0, Y ≥ 0	(non-negative constraints)

(b)



(c) Reading from the graph, the following production plans are possible from the feasible area **PQRST**:

Point **P** X = 0 units, Y = 800 units

Point **Q** X = 400 units, Y = 600 units

Point **R** X = 800 units, Y = 200 units

Point **S** X = 900 units, Y = 0 units

(d) The optimum solution is obtained at Point **Q**.

Substituting the values for X and Y into the objective function $C = 40X + 60Y$, the maximum contribution is calculated as follows:

Maximum contribution = (£40 $\times$ 400) + (£60 $\times$ 600) = £52,000

QUESTION 2

Flip Limited operates a standard costing system for the single product which it manufactures and sells. The following data relates to the standards set for Period 13 based on budgeted production and sales of 6,500 units:

		£ per unit
Direct material	(6 kg × £24.50 per kg)	147.00
Direct labour	(5 hours × £15.00 per hour)	75.00

The actual results for Period 13 were as follows:

Production and sales	6,240 units
Direct materials (purchased and used)	38,220 kg costing £923,013
Direct labour	31,700 hours costing £494,520

REQUIRED

(a) Calculate the following variances for Period 13:

(i) direct material cost (total) (1 mark)

(ii) direct material price (2 marks)

(iii) direct material usage (2 marks)

(iv) direct labour cost (total) (1 mark)

(v) direct labour rate (2 marks)

(vi) direct labour efficiency. (2 marks)

When the above variances were presented and discussed at a management meeting, the general opinion was that the direct labour variances were not representative of the actual conditions during Period 13. There had been a general shortage of skilled labour over the period and hourly rates had to be increased by 5%. Modifications had also been made to the production process from the start of the period, which were expected to reduce the standard direct labour hours per unit by 4%.

REQUIRED

(b) Using an ex-post standard, calculate the following direct labour variances for Period 13:

(i) planning (total) (4 marks)

(ii) operational rate (3 marks)

(iii) operational efficiency. (3 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 2

(a) (i) Direct material total cost variance:

(Standard unit material cost x Actual units)	–	(Actual unit material cost x Actual units)		
(£147.00 x 6,240)	–	£923,013		
£917,280	–	£923,013	=	**£5,733 Adverse**

(ii) Direct material price variance:

(Standard price x Actual usage)	–	(Actual price x Actual usage)		
(£24.50 x 38,220 kg)	–	£923,013		
£936,390	–	£923,013	=	**£13,377 Favourable**

(iii) Direct material usage variance:

(Standard price x Standard usage)	–	(Standard price x Actual usage)		
[£24.50 x (6,240 x 6 kg)]	–	(£24.50 x 38,220 kg)		
£917,280	–	£936,390	=	**£19,110 Adverse**

(iv) Direct labour total cost variance:

(Standard unit labour cost x Actual units)	–	(Actual unit labour cost x Actual units)		
(£75.00 x 6,240)	–	£494,520		
£468,000	–	£494,520	=	**£26,520 Adverse**

(v) Direct labour rate variance:

Standard rate x Actual hours)	–	(Actual rate x Actual hours)		
(£15.00 x 31,700 hours)	–	£494,520		
£475,500	–	£494,520	=	**£19,020 Adverse**

(vi) Direct labour efficiency variance:

(Standard rate x Standard hours)	–	(Standard rate x Actual hours)		
[£15.00 x (6,240 x 5 hours)]	–	(£15.00 x 31,700 hours)		
£468,000	–	£475,500	=	**£7,500 Adverse**

(b) (i) Direct labour total planning variance:

(Ex-ante std unit labour cost x Actual units)	–	(Ex-post std unit labour cost x Actual units)		
(£75.00 x 6,240 units)	–	(£75.60* x 6,240 units)		
£468,000	–	£471,744	=	**£3,744 Adverse**

Ex-post standard unit labour cost	=	Revised std rate x Revised std hour		
	=	(£15.00 x 1.05) x (5 hours x 0.96)		
	=	£15.75 x 4.8 hours	=	£75.60*

(ii) Direct labour operational rate variance:

(Revised std rate x Actual hours)	–	(Actual rate x Actual hours)		
(£15.75 x 31,700 hours)	–	£494,520		
£499,275	–	£494,520	=	**£4,755 Favourable**

(iii) Direct labour operational efficiency variance:

(Revised std rate x Actual hours)	–	(Revised std rate x Revised std hours)		
(£15.75 x 31,700)	–	[£15.75 x (6,240 x 4.8 hours)]		
£499,275	–	£471,744	=	**£27,531 Adverse**

QUESTION 3

(a) Describe the benefits that may accrue to an organisation from the operation of a budgetary planning and control system.

(6 marks)

A company manufactures and sells two products which require two types of material and two grades of labour. The following details relate to the budget for the year ending 31 December 2010:

Sales

Product P	10,000 units
Product Q	12,000 units

	Product P Per unit	**Product Q** Per unit
Direct materials		
Material X (£6.75 per kg)	2 kg	1 kg
Material Y (£8.24 per kg)	3 kg	2 kg
Direct Labour		
Skilled (£12.50 per hour)	1.2 hours	0.80 hour
Semi-skilled (£9.80 per hour)	1.6 hours	1.75 hours

Production overheads of £438,525 are charged to products on the basis of direct labour hours.

Stockholding

	1 January 2010	**31 December 2010**
Product P	2,000 units	2,500 units
Product Q	2,400 units	1,800 units
Material X	5,000 kg	4,250 kg
Material Y	8,550 kg	9,500 kg

REQUIRED

(b) Prepare the following budgets for the year ending 31 December 2010:

(i) production (units of each product) (3 marks)

(ii) purchases of Material Y (quantity in kg and cost) (4 marks)

(iii) skilled direct labour (quantity in hours and cost). (3 marks)

(c) Calculate the budgeted production cost per unit for Product P. (4 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 3

(a)

Budgets provide a means of *communicating* management's plans throughout the organisation.

Budgets force managers to *think about* and *plan* for the future. In the absence of the necessity to prepare a budget, many managers would spend all of their time dealing with daily crises.

The budgeting process provides a means of *allocating resources* to those parts of the organisation where they can be used most effectively.

The budgeting process can uncover *potential bottlenecks* before they occur.

Budgets *co-ordinate* the activities of the entire organisation by *integrating* the plans of the various parts thus helping to ensure that everyone in the organisation is pulling in the same direction.

Budgets *define goals and objectives* that can serve as benchmarks for *evaluating* subsequent performance.

(b) (i) Production budget (units)

	Product P (units)	**Product Q** (units)
Budgeted sales units	10,000	12,000
Add Closing stock	2,500	1,800
	12,500	13,800
Less: Opening stock	2,000	2,400
Budgeted production units	10,500	11,400

(ii) Purchases budget (quantity in kg and cost for Material Y)

	Product P	**Product Q**	**Total**
Budgeted production units	10,500	11,400	
Material required per unit	× 3	× 2	
kg required for production	31,500 kg	22,800 kg	54,300 kg
Add Closing stock			9,500 kg
			63,800
Less Opening stock			8,550 kg
Budgeted purchases (quantity)			55,250 kg
× Cost of material per kg			× £8.24
Budgeted purchases (costs)			£455,260

(iii) Direct labour (Skilled) budget (quantity in hours and cost)

	Product P	**Product Q**	**Total**
Budgeted production units	10,500	11,400	
Hours required per unit	× 1.2	× 0.8	
Budgeted labour hours	12,600	9,120	21,720
× Cost of labour per hour			× £12.50
Budgeted labour cost			£271,500

QUESTION 3 CONTINUED

(c) Production cost per unit for Product P

		£	£
Direct materials			
Material X	(2 × £6.75)	13.50	
Material Y	(3 × £8.24)	24.72	
			38.22
Direct labour			
Skilled labour	(1.2 × £12.50)	15.00	
Semi-skilled labour	(1.6 × £9.80)	15.68	
			30.68
Production overheads [(1.2 + 1.6) × £7.50*]			21.00
Production cost per unit for Product P			89.90

*Production overhead absorption rate = $\frac{\text{Production overheads}}{\text{Direct labour hours}} = \frac{£438,525}{58,470**} = £7.50$

**Direct labour hours = [10,500 × (1.2 + 1.6)] + [11,400 × (0.8 + 1.75)] = 58,470 hours

QUESTION 4

(a) Describe the limitations of the accounting rate of return as a method of evaluating investment projects. (6 marks)

A company is considering two alternative investment projects both of which require the purchase of new equipment. The following information relates to the two projects:

	Project A	**Project B**
Duration	4 years	3 years
Purchase cost of equipment	£500,000	£330,000
Estimated annual net cash inflows:		
Years 1 – 3	£30,000	£140,000
Year 4	£630,000	–
Estimated disposal value of equipment	£50,000	£40,000

Assume that net cash inflows occur at the end of the years to which they relate.

The company's depreciation policy is to write off the cost of equipment using the straight-line method.

Cost of capital is 10% per annum.

Discount factors:

Year	**5%**	**10%**	**15%**	**20%**	**25%**
1	0.952	0.909	0.870	0.833	0.800
2	0.907	0.826	0.756	0.694	0.640
3	0.864	0.751	0.658	0.579	0.512
	2.723	2.486	2.284	2.106	1.952
4	0.823	0.683	0.572	0.482	0.410

REQUIRED

(b) Calculate for each of **Project A** and **Project B**, the

(i) net present value (6 marks)

(ii) internal rate of return. (6 marks)

(c) Recommend which project should be undertaken giving reasons for your decision. (2 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 4

(a) Limitations of the accounting rate of return method include the following:

Cash flows are ignored and only accounting profits are considered;

Time value of money not taken into account;

Use of different accounting policies may distort profit figures;

Uncertainty and risk are not taken into account.

(b)

(i) Net present value (discounted at 10%)

Project A

Year	Cash flow	Factor	Present value
	£000		**£000**
0	(500)	1.000	(500.00)
1 – 3	30	2.486	74.58
4	680	0.683	464.44
		NPV =	39.02 = £39,020

Project B

Year	Cash flow	Factor	Present value
	£000		**£000**
0	(330)	1.000	(330.00)
1 – 3	140	2.486	348.04
3	40	0.751	30.04
		NPV =	48.08 = £48,080

(b)

(ii) Internal rate of return

Project A (discounted at 15%)

Year	Cash flow	Factor	Present value
	£000		**£000**
0	(500)	1.000	(500.00)
1 – 3	30	2.284	68.52
4	680	0.572	388.96
		NPV =	(42.52)

Project B (discounted at 20%)

Year	Cash flow	Factor	Present value
	£000		**£000**
0	(330)	1.000	(330.00)
1 – 3	140	2.106	294.84
3	40	0.579	23.16
		NPV =	(12.00)

IRR for Project A = 10% + {5% × [39.02 ÷ (39.02 + 42.52)]} = 12.4%

IRR for Project B = 10% + {10% × [48.08 ÷ (48.08 + 12.00)]} = 18.0%

(c) Project B should be selected over Project A as it generates a higher NPV and earns a higher IRR.

QUESTION 5

(a) Describe the objectives of a system of transfer pricing between divisions in a decentralised organisation.

(5 marks)

The following partial financial information relates to the two divisions of a company for Period 6:

	Division L	**Division M**
Net profit	Missing figure	£450,000
Sales	Missing figure	£5,000,000
Return on capital employed (ROCE)	15%	Missing figure
Net assets investment	£1,500,000	Missing figure
Net profit margin	8%	9%
Net asset turnover (number of times)	Missing figure	2.5
Residual income	Missing figure	£150,000
Cost of capital	12%	Missing figure

REQUIRED

(b) Calculate for **Division L**, the following missing figures for Period 6:

(i) net profit (2 marks)

(ii) sales (2 marks)

(iii) net asset turnover ratio (number of times) (2 marks)

(iv) residual income (RI). (2 marks)

(c) Calculate for **Division M**, the following missing figures for Period 6:

(i) net assets investment (2 marks)

(ii) return on capital employed (ROCE) (2 marks)

(iii) cost of capital. (3 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 5

(a) A system of transfer pricing is designed to:

Promote autonomy among the divisions in order for decentralisation to work effectively.

Motivate the managers of both the selling and buying divisions to trade with each other.

Contribute to a measure of divisional performance, which can be used as a basis for evaluation.

Encourage goal congruence, thereby ensuring that the profits of the business as a whole are optimised.

Provide a basis for allocating resources within a division, thereby ensuring that managers are able to make correct decisions.

(b)

(i) **Net profit for Division L** = Net assets investment $\times$ ROCE

£1,500,000 $\times$ 0.15 = £225,000

(ii) **Sales for Division L** = $\frac{\text{Net profit}}{\text{Net profit margin}}$ = $\frac{£225,000}{0.08}$ = £2,812,500

(iii) **Net asset turnover for Div. L** = $\frac{\text{Sales}}{\text{Net assets investment}}$ = $\frac{£2,812,500}{£1,500,000}$ = 1.875

(iv) **RI for Division L** = Net profit – (Net assets investment $\times$ Cost of capital)

£225,000 – (£1,500,000 $\times$ 12%) = £225,000 – £180,000 = £45,000

(c)

(i) **N A investment for Division M** = $\frac{\text{Sales}}{\text{Net assets t/o ratio}}$ = $\frac{£5,000,000}{2.5}$ = £2,000,000

(ii) **ROCE for Division M** = $\frac{\text{Net profit}}{\text{Net assets investment}} \times 100\%$

$\frac{£\ 450,000}{£2,000,000} \times 100\%$ = 22.5%

(iii) **Cost of capital for Division M** = $\frac{\text{Net profit – Residual income}}{\text{Net assets investment}} \times 100\%$

$\frac{£450,000 – £150,000}{£2,000,000} \times 100\%$ = 15%

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