

Cost Accounting Level 3



Model Answers

Series 3 2008 (Code 3016)

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How to use this booklet

Model Answers have been developed by Education Development International plc (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.

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QUESTION 1

A company uses a two stage processing system to jointly produce its three main products, Products A, B and C. By-product D is also produced during the process.

Product A is complete at the end of stage 1 and Products B, C and By-product D emerge at the end of stage 2.

Information regarding the joint process for the last period is as follows:

Input

Process stage 1

Raw material X	360 kg at £6 per kg
Raw material Y	400 kg at £5 per kg
Direct labour	510 hrs at £8 per hr

Process stage 2

Raw material Z	800kg at £4 per kg
Direct labour	200hrs at £8 per hr

Factory overheads in each process stage are absorbed at £12.00 per direct labour hour.

Output

Process stage 1	Quantity	Selling price per kg
Product A	120 kg	£30
Material transfer to stage 2	600 kg	-
Process stage 2		
Product B	650 kg	£20
Product C	550 kg	£25
By-product D	150 kg	£8

Process losses from stage 1 are disposed of at a cost of £1 per kg. The losses that occurred in stage 1, in the last period, were normal.

No losses are expected in stage 2.

There was no work in progress at the beginning or at the end of the period in either process stage.

Joint processing costs are apportioned on the basis of relative weight of output.

REQUIRED

(a) For the last period prepare the process accounts for:

- (i) Process stage 1
- (ii) Process stage 2

(12 marks)

(b) Assuming that all production was sold prepare a profit statement for the last period.

(4 marks)

(c) Explain the meaning of:

- (i) Joint products
- (ii) By-product

(4 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 1

(a)

Process stage 1 account					
	kg	£		kg	£
Material X	360	2160	Product A	120	2400
Material Y	400	2000	Transfer to process 2	600	12000
Labour		4080	Normal loss	40	
Overheads		6120			
Process loss/disposals		<u>40</u>			
	<u>760</u>	<u>14400</u>		<u>760</u>	<u>14400</u>

Workings:

Product A $14,400 \times 120/720 = \text{£}2,400$
 Transfer to process 2 $14,400 \times 600/720 = \text{£}12,000$

or

Cost per kg = $14,400 / (760 - 40) = \text{£}20$ per kg
 Product A $\text{£}20 \times 120 = \text{£}2,400$
 Transfer to process 2 $\text{£}20 \times 600 = \text{£}12,000$

Process stage 2 account					
	kg	£		kg	£
Process 1	600	12000	Product B	650	9360
Material Z	800	3200	Product C	550	7920
Labour		1600	By-Product D	150	1200
Overheads		<u>2400</u>	Abnormal loss	<u>50</u>	<u>720</u>
	<u>1400</u>	<u>19200</u>		<u>1400</u>	<u>19200</u>

Workings:

Product B $(19,200 - 1,200) \times 650/1,250 = \text{£}9,360$
 Product C $(19,200 - 1,200) \times 550/1,250 = \text{£}7,920$
 Abnormal loss $(19,200 - 1,200) \times 50/1,250 = \text{£}720$

or

Cost per kg = $(19,200 - 1,200) / (1,400 - 150) = \text{£}14.40$ per kg
 Product B $(14.40 \times 650) = \text{£}9,360$
 Product C $(14.40 \times 550) = \text{£}7,920$
 Abnormal loss $(14.40 \times 50) = \text{£}720$

MODEL ANSWER TO QUESTION 1 CONTINUED

(b)

Profit Statement (£)				
Product	A	B	C	Total
Sales	3600	13000	13750	30350
Process costs	2400	9360	7920	<u>19680</u>
				10670
Less abnormal loss				<u>720</u>
Process Profit				<u>9950</u>

(c) (i) Joint products

Two or more products separated in processing, each having a sufficiently high saleable value to merit recognition as a main product.

(ii) By-product

A product that has commercial value but is not the product, or products, for which the production process is intended.

QUESTION 2

A company manufactures and distributes a single product. The variable costs per unit are as follows:

Direct materials	£60.00
Direct labour	£25.00
Variable overheads	£15.00

The product sells for £125.00 per unit and the company expects total sales revenue in this current year of £1,250,000. Fixed overheads are forecasted at £200,000 for the year.

REQUIRED

(a) Calculate for the current year the:

- (i) break-even point in units
- (ii) contribution/sales ratio
- (iii) margin of safety as a percentage of sales
- (iv) expected profit.

(8 marks)

The following changes in cost are expected in the following year:

- Raw material prices to increase by 5%
- Direct wage rate to increase by 4%
- Variable overheads to rise by 8% per unit of product
- Fixed overheads to increase by £17,800.

REQUIRED

(b) Calculate for the following year:

- (i) a new selling price that maintains the current year's contribution/sales ratio
- (ii) the sales volume required to maintain the current year's margin of safety percentage if the selling price remains at £125
- (iii) the sales volume required to maintain the current year's profit if the selling price remains at £125.

(12 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 2

(a)

	£/unit	£/unit
Selling price		125.00
Direct materials	60.00	
Direct labour	25.00	
Variable o/heads	<u>15.00</u>	
Contribution		<u>100.00</u> <u>25.00</u>

- (i) Breakeven = Fixed overheads/unit contribution
= 200,000/25
= 8,000 units
- (ii) Contribution/sales ratio = 25/125
= 20%
- (iii) Margin of safety [(Sales volume – break-even)/Sales volume] x 100%
= [(10,000 – 8,000)/10,000] x 100%
= 20%
- (iv) Expected profit = Total contribution – fixed overheads
= 20% x 1,250,000 – 200,000
= £50,000

(b) Variable costs for following year:

	£
Direct material	63.0
Direct labour	26.0
Variable o/heads	<u>16.2</u>
	<u>105.2</u>

- (i) Selling price
Contribution/sales ratio = $\frac{\text{Selling price} - \text{unit variable cost}}{\text{Selling price}}$
0.20 = $\frac{\text{SP} - 105.2}{\text{SP}}$
SP (0.20 – 1) = -105.2
SP (1 – 0.20) = 105.2
SP = 105.2/0.8
Selling price = **£131.50**
- (ii) Sales volume (margin of safety)
Break-even = Fixed overheads/unit contribution
= $\frac{200,000 + 17,800}{125 - 105.2}$
= 11,000 units
- Margin of safety = $\frac{\text{Sales volume} - \text{break-even}}{\text{Sales volume}}$
0.20 = $\frac{\text{SV} - 11,000}{\text{SV}}$
SV (1 – 0.20) = 11,000
Sales volume = **13,750 units**

MODEL ANSWER TO QUESTION 2 CONTINUED

(iii) Sales volume (profit)

$$\begin{aligned}\text{Total contribution required} &= \text{Current years profit} + \text{increased fixed overheads} \\ &= 50,000 + 217,800 \\ &= \text{£}267,800 \\ \text{Sales volume required} &= 267,800 / (125 - 105.2) \\ &= \mathbf{13,525 \text{ units}}\end{aligned}$$

QUESTION 3

A company, which produces a single product and uses a standard costing system, prepares a monthly reconciliation statement showing the variances between standard production costs and actual costs.

The following is the statement for the month just ended.

Standard cost of production		£28,560
Variences:		
Material price	1360A	
Material usage	200A	
Labour rate	300A	
Labour efficiency	320F	
Fixed overhead expenditure	600A	
Fixed overhead volume	480F	<u>1,660A</u>
Actual cost of production		£30,220

Actual production for the month 420 units

The standard direct cost for one unit was as follows:

Direct materials	8 kg @ £4 per kg
Direct labour	2 hours @ £8 per hour

Fixed production overheads are absorbed at a rate of £10 per direct labour hour.

REQUIRED

(a) Calculate for the month just ended:

- (i) the actual quantity of direct materials used and the total actual direct material cost (assume usage quantity equals purchased quantity)
- (ii) the actual direct labour hours worked and the actual direct labour cost
- (iii) the actual fixed production overhead incurred
- (iv) the budgeted production units.

(14 marks)

(b) State possible reasons for the variances on:

- (i) Direct material
- (ii) Direct labour.

(6 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 3

- (a) (i) Material usage variance = Std price (Std usage for actual prod – actual usage)
 $200A = 4 [(420 \times 8) - \text{actual usage}]$
Actual quantity of direct material used = 3,410 kg
Material price variance = (Actual usage x std price) – actual cost
 $1360A = (3410 \times 4) - \text{actual cost}$
Actual direct material cost = £15,000
- (ii) Labour efficiency variance = Std rate (std hours for actual production – actual hours)
 $320F = 8 (2 \times 420 - \text{actual hours})$
Actual direct labour hours worked = 800 hours
Labour rate variance = (Actual hours x std rate) – actual cost
 $300A = (800 \times 8) - \text{actual cost}$
Actual direct labour cost = £6,700
- (iii) Fixed overhead volume variance = (Std rate x std dir lab hours for actual production) – budgeted overhead
 $480F = (10 \times 2 \times 420) - \text{budgeted overhead}$
Budgeted overhead = £7,920
Fixed overhead expenditure variance = Actual overhead – Budgeted overhead
 $600A = \text{Actual overhead} - 7,920$
Actual overhead = £8,520
- (iv) **Budgeted production (units)** = Budgeted o/h/Fixed o/h absorption rate per unit
 $= 7920/10 \times 2$
= 396 units
Or using Fixed Overhead Volume Variance:
 $\frac{480F}{(10 \times 2)} = 24$
Therefore $420 - 24$
= 396 units
- (b) (i) Direct material variances:
The company's supplier could have increased the cost per kg (adverse price variance). The material supplied could have been inferior quality or more scrap was generated than budgeted for and as a consequence more material than standard could have been used (adverse usage variance).
- (ii) Direct labour variances:
The company could have increased the employees rate of pay (adverse rate variance) which in turn motivated the employees to complete the work in a time that was quicker than the standard time (favourable efficiency variance).

QUESTION 4

A company sells four products (P, Q, R, and S). The products are manufactured on a bank of 20 machines, any of which can be used on each of the products. Each machine can produce 101 hours of work per period.

The following information is provided for the next period:

	Product			
	P	Q	R	S
Units required	60	100	200	150
Selling price (per unit)	£104	£76	£72	£92
Direct labour (per unit)	4.0 hrs	2.0 hrs	2.5 hrs	3.0 hrs
Direct materials (per unit)	£40	£24	£29	£38
Machine hours (per unit)	5.0 hrs	4.0 hrs	3.0 hrs	6.0 hrs
Fixed overheads (per unit)	£6.00	£3.00	£2.00	£5.00

Fixed overheads for the period are £1,720
Direct labour costs £8.00 per hour.

REQUIRED

- (a) Calculate the production capacity shortfall (in machine hours) in the next period. (2 marks)
- (b) Determine the production quantities of each product which will maximise profit in the next period. (8 marks)
- (c) Prepare a statement showing both contribution and profit for the period based on your answer to (b) above. (4 marks)

The company is considering working overtime to overcome the shortfall in production capacity. If overtime is worked the labour cost per unit will increase by 25%, for the additional hours worked, and the fixed overheads will increase by £500 per period.

REQUIRED

- (d) Advise the company whether to introduce overtime to overcome the production capacity shortfall. Your advice should be accompanied by calculation. (6 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 4

(a) Capacity shortfall

Machine hours required

Product P	60 x 5 =	300
Product Q	100 x 4 =	400
Product R	200 x 3 =	600
Product S	150 x 6 =	<u>900</u>
		<u>2,200</u>

Machine hours available (20 x 101) = 2,020

Capacity shortfall = **180 machine hours**

(b) Production quantities

Product	P	Q	R	S
Labour (£/unit)	32	16	20	24
Material (£/unit)	<u>40</u>	<u>24</u>	<u>29</u>	<u>38</u>
Variable cost (£/unit)	72	40	49	62
Selling price (£/unit)	<u>104</u>	<u>76</u>	<u>72</u>	<u>92</u>
Contribution (£/unit)	32	36	23	30
Machine hours per unit	5	4	3	6
Cont/machine hour (£)	6.40	9.00	7.67	5.00
Production priority	3	1	2	4
Production schedule:				
Product Q	100 units		400 machine hours	
Product R	200 units		600 machine hours	
Product P	60 units		300 machine hours	
Product S	120 units		720 machine hours	
			2020 machine hours	

Workings:

Total machine hours required to produce products Q, R & P	= 1,300
Therefore, machine hours available to produce product S	= 2,020 – 1,300
	= 720 hrs
Therefore, number of units of product S	= 720/6
	= 120 units

(c) Profit statement

Product	Unit contribution	Production quantities	£	£
P	32	60	1920	
Q	36	100	3600	
R	23	200	4600	
S	30	120	<u>3600</u>	
Total contribution				13,720
Less fixed overheads				<u>1,720</u>
Profit				<u>12,000</u>

MODEL ANSWER TO QUESTION 4 CONTINUED

(d) Advice on overtime

Produce 30 units of product S in overtime hours

Additional unit labour cost of overtime = $25\% \times \text{£}24$
= $\text{£}6$ per unit

Revised contribution per unit = $\text{£}30 - \text{£}6$
= $\text{£}24$ per unit

Total additional contribution = $30 \times \text{£}24$
= $\text{£}720$

Additional fixed costs = $\text{£}500$

Therefore, additional profit = $\text{£}220$

Advise the company to work overtime.

QUESTION 5

A manufacturing company has prepared the following monthly overhead budget for its cost centre B15.

Units produced	4,500	5,000	5,500	6,000
	£	£	£	£
Indirect materials	22,500	24,500	26,950	29,400
Indirect labour	13,500	15,000	17,325	18,900
Power	2,360	2,560	2,760	2,960
Maintenance	13,200	14,500	15,800	17,100
Depreciation	6,440	6,440	6,440	6,440
Supervision	18,000	27,000	27,000	36,000

The variable indirect material cost per unit reduces by 2% for production of 5,000 units and over.

The variable indirect labour cost per unit increases by 5% for production of 5,500 units and over.

In Month 1 5,200 units were produced and actual overhead expenditure was:

	£
Indirect materials	26,480
Indirect labour	15,100
Power	2,540
Maintenance	15,620
Depreciation	6,240
Supervision	27,800

REQUIRED

(a) Briefly explain the main difference between flexible and fixed budgets. (4 marks)

(b) Prepare a statement for Month 1 for cost centre B15, showing for each item of cost, the following:

Flexed budget allowance

Actual cost

Expenditure variance.

(16 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 5

- (a) A fixed budget is normally set prior to the start of an accounting period and used for planning purposes. It is based on one level of activity.

A flexible budget, used for control purposes, changes in response to changes in activity by recognising different cost behaviour patterns.

- (b) Cost Centre Budget Statement Month 1
Production 5,200 units

Overhead costs	Flexed budget	Actual	Variance
	£	£	£
Indirect material	25,480	26,480	1000A
Indirect labour	15,600	15,100	500F
Power	2,640	2,540	100F
Maintenance	15,020	15,620	600A
Depreciation	6,440	6,240	200F
Supervision	<u>27,000</u>	<u>27,800</u>	<u>800A</u>
	<u>92,180</u>	<u>93,780</u>	<u>1,600A</u>

Workings:

Indirect material:

At the actual production output of 5,200 units (i.e. over 5,000 units) the 2% unit cost reduction will have been received.

The budgeted costs for production outputs of 5,000, 5,500 and 6,000 units included in this reduction.

Budgeted output	Unit cost
5,000 units	$24,500/5,000 = £4.90$
5,500 units	$26,950/5,500 = £4.90$
6,000 units	$29,400/6,000 = £4.90$

Unit costs the same, hence indirect material is a variable cost between these outputs. Therefore, flexed budget at 5,200 units output = $5,200 \times £4.90 = £25,480$.

Indirect labour:

At the actual production output of 5,200 units (i.e. under 5,500 units), no increase in unit cost is incurred.

The budgeted costs for production outputs of 4,500 and 5,000 units do not include the increase.

Budgeted output	Unit cost
4,500 units	$13,500/4,500 = £3.00$
5,000 units	$15,000/5,000 = £3.00$

Unit costs the same, hence indirect labour is a variable cost between these outputs. Therefore, flexed budget at 5,200 units output = $5,200 \times £3.00 = 15,600$.

MODEL ANSWER TO QUESTION 5 CONTINUED

Workings continued:

Power:

Total overhead	=	Fixed o/h + (unit variable o/h x units)
(Using output units of 5,000 and 5,500)		
2,760	=	Fixed o/h + (uv o/h x 5,500)
<u>2,560</u>	=	<u>Fixed o/h + (uv o/h x 5,000)</u>
200	=	uv o/h x 500
Variable o/h	=	£0.40 per unit
Fixed o/h	=	2,560 - 0.40 x 5,000
	=	£560
(Using output units of 5,500 and 6,000)		
2,960	=	Fixed o/h + (uv o/h x 6,000)
<u>2,760</u>	=	<u>Fixed o/h + (uv o/h x 5,500)</u>
200	=	uv o/h x 500
Variable o/h	=	£0.40 per unit
Fixed o/h	=	2,560 - 0.40 x 5,000
	=	£560

Fixed and variable unit costs the same for each range of production outputs.
Therefore, flexed budget at 10,400 units = 560 + (5,200 x 0.40)
= £2,640

Maintenance:

Total overhead	=	Fixed o/h + (unit variable o/h x units)
(Using output units of 10,000 and 11,000)		
15,800	=	Fixed o/h + (uv o/h x 5,500)
<u>14,500</u>	=	<u>Fixed o/h + (uv o/h x 5,000)</u>
1,300	=	uv o/h x 500
Variable o/h	=	£2.60 per unit
Fixed o/h	=	14,500 - 2.60 x 5,000
	=	£1,500
(Using output units of 5,500 and 6,000)		
17,100	=	Fixed o/h + (uv o/h x 6,000)
<u>15,800</u>	=	<u>Fixed o/h + (uv o/h x 5,500)</u>
1,300	=	uv o/h x 500
Variable o/h	=	£2.60 per unit
Fixed o/h	=	14,500 - 2.60 x 5,000
	=	£1,500

Fixed and variable unit costs the same for each range of production outputs.
Therefore, flexed budget at 5,200 units = 1,500 + (5,200 x 2.60)
£15,020

QUESTION 6

A manufacturing company operates a non-integrated accounting system. For the accounting year ended 31 December Year 7 the statement which reconciles the profit shown in the Financial Accounts with that shown in the Cost Accounts is as follows:

	£	£
Profit as per financial accounts		54,000
Add:		
Raw material closing stock difference	800	
Work in progress opening stock difference	1,000	
Finished goods closing stock difference	4,600	
Under absorbed production overheads carried forward in the Cost Accounts	<u>1,500</u>	
		<u>7,900</u>
		61,900
Deduct:		
Raw material opening stock difference	1,500	
Work in progress closing stock difference	900	
Finished goods opening stock difference	2,500	
Dividends received	2,750	
Rent received	<u>8,000</u>	
		<u>15,650</u>
Profit as per cost accounts		<u>46,250</u>

The Financial ledger included the following stock accounts for Year 7:

Raw Materials					
1 Jan	Balance b/f	17,500	Jan-Dec	Return to suppliers	1,560
Jan-Dec	Purchases	265,600	Jan-Dec	Work in progress	215,200
			31 Dec	Balance c/f	<u>66,340</u>
		<u>283,100</u>			
Work in Progress					
1 Jan	Balance b/f	35,200	Jan-Dec	Finished Goods	663,700
Jan-Dec	Raw Materials	215,200	31 Dec	Balance c/f	37,500
Jan-Dec	Direct Wages	315,600			
Jan-Dec	Prod Overheads	<u>135,200</u>			
		<u>701,200</u>			<u>701,200</u>
Finished Goods					
1 Jan	Balance b/f	65,500	Jan-Dec	Cost of Goods Sold	654,400
Jan-Dec	Work in Progress	<u>663,700</u>	31 Dec	Balance c/f	<u>74,800</u>
		<u>729,200</u>			<u>729,200</u>

REQUIRED

- (a) For the year ended 31 December Year 7 prepare the following Accounts, as they would appear in the Cost Ledger:
- Raw Material Stock Control Account
 - Work in Progress Stock Control Account
 - Finished Goods Stock Control Account
 - Production Overhead Control Account. Balance in this account as at 1 Jan year 7 was nil.

(16 marks)

- (b) Distinguish between integrated and non-integrated accounting systems.

(4 marks)

(Total 20 marks)

MODEL ANSWER TO QUESTION 6

(a) **Year 7**

(i)

		£	Raw Material		£
1 Jan	Balance b/f	19,000	Jan-Dec	Returns to suppliers	1,560
Jan-Dec	Purchases	265,600	Jan-Dec	Work in progress	215,900
			31 Dec	Balance c/f	<u>67,140</u>
		<u>284,600</u>			<u>284,600</u>

(ii)

		Work in Progress			
1 Jan	Balance b/f	34,200	Jan-Dec	Finished Goods	662,800
Jan-Dec	Raw Materials	215,900	31 Dec	Balance c/f	36,600
Jan-Dec	Direct Wages	315,600			
Jan-Dec	Prod Overheads	<u>133,700</u>			
		<u>699,400</u>			<u>699,400</u>

(iii)

		Finished Goods			
1 Jan	Balance b/f	68,000	Jan-Dec	Cost of Goods Sold	651,400
Jan-Dec	Work in Progress	<u>662,800</u>	31 Dec	Balance c/f	<u>79,400</u>
		<u>730,800</u>			<u>730,800</u>

(iv)

		Production Overhead			
Jan-Dec	Cost ledger	135,200	Jan-Dec	Work in Progress	133,700
			31 Dec	Balance c/f	<u>1,500</u>
		<u>135,200</u>			<u>135,200</u>

(b) Integrated accounts – a set of accounting records which provides both financial and cost accounts using common data.

Non-integrated accounts – a system in which the cost accounts are distinct from the financial accounts, the two sets of accounts being kept in agreement by use of control accounts or reconciled by other means.