

Management Accounting

Level 3

Model Answers

Series 4 2004 (Code 3023)

Vision Statement

Our vision is to contribute to the achievements of learners around the world by providing integrated assessment and learning services, adapted to meet both local market and wider occupational needs and delivered to international standards.



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Management Accounting Level 3

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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 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.

EDI 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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QUESTION 1

REQUIRED

- (a) Explain what a limiting factor is and how it is relevant to a business. (7 marks)
- (b) State, and comment upon, the assumptions of cost-volume-profit analysis. (7 marks)
- (c) Explain, and illustrate with an example, the calculation of a selling price to achieve a specified gross margin %. (6 marks)

(Total 20 marks)

Model Answer to Question 1

- (a) Limiting factor:

A limiting factor is anything that limits the activity of a business entity. For many businesses this may be sales demand. For other businesses, however, the limiting factor may be a shortage of supply (maybe temporarily) of a resource that the business uses which then restricts the amount that a business can produce and sell. In such a situation a business should seek to optimise the benefit it obtains from the limiting factor by prioritising the allocation of the scarce resource in such a way as to ensure achievement of objectives to the fullest extent possible.

If a business is seeking to maximise profit then the scarce resource should be allocated to products (subject to maximum demand limits on each product) according to the profit contribution that each product makes per unit of the scarce resource.

- (b) Cost-volume-profit analysis:

The assumptions of cost-volume-profit analysis are:

- Costs can be analysed into fixed and variable elements
- Total fixed costs unchanged at all levels of activity
- Variable costs per unit unchanged at all levels of activity
- Selling price unchanged at all levels of activity
- Constant sales mix where more than one product

The above assumptions are generally recognised as over-simplified and limit the application of cost-volume-profit analysis. It nevertheless remains a useful tool as long as the limitations are recognised and greater sophistication built into the analysis when required. For example, additional analysis can be carried out with changed assumptions regarding selling price, sales mix or cost behaviour. Also, although the linear cost assumption is unlikely to remain valid over the whole potential activity range it may well be valid over a much narrower range of interest.

Model Answer to Question 1 continued

(c) Sales pricing:

The gross margin % is gross profit expressed as a % of sales. If a required gross margin % is specified then the production cost/cost of goods expressed as a % of sales must be (100 - gross margin %).

This cost % (ie 100 - gross margin %), expressed as a decimal, needs to be divided into the production cost/cost of goods per unit in order to determine the selling price required.

For example: production cost/cost of goods £6.00 per unit; specified gross margin 40%

Selling price = £10.00 per unit [$£6.00 \div (1 - 0.4)$].

Gross profit = £4.00 per unit (£10.00 - £6.00) which is a margin of 40% of sales.

QUESTION 2

The following data is provided relating to a production cost centre within a factory for a period:

Budget: Overhead £290,320 at output of 10,000 tonnes
Overhead £306,720 at output of 12,000 tonnes
(the high-low method may be used to establish cost behaviour)
Overhead absorption rate £26.80 per tonne (total of fixed and variable overhead)

Actual: Output 11,600 tonnes
Overhead £305,180

REQUIRED

- (a) Use the high-low method to establish the budgeted variable production overhead absorption rate. (2 marks)
- (b) Calculate for the period the:
- (i) budgeted total fixed production overhead and the fixed production overhead absorption rate (4 marks)
 - (ii) budgeted output (ie fully absorbing budgeted overhead at the rate of £26.80 per tonne) (2 marks)
 - (iii) production overhead absorbed (2 marks)
 - (iv) production overhead over/under absorption (3 marks)
 - (v) fixed production overhead volume variance. (3 marks)
- (c) Explain the difference between a fixed budget and a flexible budget. (4 marks)

(Total 20 marks)

Model Answer to Question 2

- (a) Budgeted variable production overhead absorption rate:

Using the high-low method:

$$[(£306,720 - £290,320) \div (12,000 - 10,000 \text{ tonnes})] = \underline{£8.20} \text{ per tonne}$$

- (b) (i) Budgeted fixed production overhead:

Using output of 10,000 tonnes:

$$\text{Budgeted total fixed production overhead} = [£290,320 - (10,000 \text{ tonnes @ } £8.20)] = \underline{£208,320}$$

$$\text{or} = [£306,720 - (12,000 \text{ tonnes @ } £8.20)] = \underline{£208,320}$$

$$\text{Budgeted fixed production overhead absorption rate} = \underline{£18.60} \text{ per tonne } (£26.80 - £8.20)$$

- (ii) Budgeted output = 11,200 tonnes (£208,320 ÷ £18.60 per tonne)
- (iii) Production overhead absorbed = £310,880 (11,600 tonnes @ £26.80)
- (iv) Production overhead over/under absorption = £5,700 over absorbed (£310,880 – £305,180)
- (v) Fixed production overhead volume variance = £7,440 favourable [(11,600 – 11,200 tonnes) × £18.60/tonne]
or [(11,600 tonnes @ £18.60) – £208,320]

- (c) Fixed and flexible budgets:

The essential difference between a fixed budget and a flexible budget is that whereas a fixed budget sets a cost budget in advance for a particular level of activity for planning purposes, a flexible budget adjusts expected costs to the actual activity, according to their behavioural characteristics, for control purposes.

QUESTION 3

A company is evaluating the viability of investing £800,000 in new manufacturing facilities to enable the launch of a new product. The product life cycle is estimated at six years. The manufacturing facilities would be expected to have a disposal value of £80,000 after six years.

Sales demand for the new product is estimated at two levels:

	High demand	Low demand
Year 1	12,000 units	8,000 units
Years 2– 5	20,000 units per annum	16,000 units per annum
Year 6	8,000 units 6,000	units

It is believed that there is an equal chance of each level of sales occurring.

Other details relating to the new product launch include:

- (1) Selling price: £50 per unit.
- (2) Contribution/sales ratio: 45%.
- (3) Depreciation of new manufacturing facilities: £8.00 per unit (based on the high demand estimate).
- (4) Incremental fixed overheads (other than depreciation of the new manufacturing facilities) are estimated at £110,000 per annum.
- (5) The product would be charged a £10.00 per unit share of general fixed overheads.
- (6) Investment in working capital would be £85,000 in Year 0, rising to £120,000 at the end of Year 1. The working capital investment would be released at the end of Year 6.

REQUIRED

- (a) Calculate the expected value of the sales of the new product (in units) for each of the six years. (3 marks)

- (b) Using the expected sales units from (a) above, and other relevant information, prepare a schedule of the expected project cash flows in each year. (9 marks)

- (c) Calculate the expected net present value and internal rate of return of the project using the following discount factors:

Discount factors:	At 10% (the cost of capital)	At 20%
Year 1	0.909	0.833
Year 2	0.826	0.694
Year 3	0.751	0.579
Year 4	0.683	0.482
Year 5	0.621	0.402
Year 6	0.564	0.335

(8 marks)

(Total 20 marks)

Model Answer to Question 3

(a) Expected value of sales (units):

Year 1	10,000 units	$[(12,000 + 8,000) \div 2]$ or $[(12,000 \times 0.5) + (8,000 \times 0.5)]$
Years 2 - 5	18,000 units	$[(20,000 + 16,000) \div 2]$
Year 6	7,000 units	$[(8,000 + 6,000) \div 2]$

(b) Schedule of cash flows:

Year	Expected sales units	$\times \text{£}22.50/\text{unit} = \text{Contribution}$ £000	Incremental fixed costs £000	Working capital £000	Capital investment £000	Net cash flow £000
0				(85)	(800)	(885)
1	10,000	225	(110)	(35)		80
2 - 5	18,000	405	(110)			295
6	7,000	157.5	(110)	120	80	247.5

(c) Net present value and internal rate of return:

Year	Net cash flow £000	Discount factors		Present values	
		10%	20%	at 10%	at 20%
0	(885)	1.000	1.000	(885)	(885)
1	80	0.909	0.833	72.7	66.6
2 - 5	295	2.881	2.157	849.9	636.3
6	247.5	0.564	0.335	<u>139.6</u>	<u>82.9</u>
				<u>177.2</u>	<u>(99.2)</u>

Net present value (NPV) = £177,200

Internal rate of return (IRR) = $10\% + [(20\% - 10\%) \times (177.2 \div 276.4)]$

= 16.4%

QUESTION 4

Investment Centre A manufactures a single product which is transferred to another investment centre in the same group. Budgets for next year for Investment Centre A include:

Sales	3,000 units
Variable costs	£40 per unit
Fixed costs	£100,000
Capital employed	£250,000 (unaffected by changes in activity)

REQUIRED

- (a) Calculate the transfer price of the product that will achieve a 20% return on capital employed (ROCE) for Investment Centre A. (6 marks)
- (b) Using the transfer price calculated in (a) above, calculate for Investment Centre A:
- (i) the break-even sales units (3 marks)
 - (ii) the profit/loss if sales are 2,800 units in the year. (3 marks)
- (c) If the transfer price is set at £85 per unit, calculate the number of units that would need to be sold for Investment Centre A to achieve a return on capital employed (ROCE) of 16%. (4 marks)
- (d) Calculate the residual income (RI) for Investment Centre A based on the budget details above and:
- Transfer price of £90 per unit
 - Cost of capital of 12% per annum. (4 marks)

(Total 20 marks)

Model Answer to Question 4

(a) Transfer price:

$$\text{Required contribution} = \text{£}150,000 [(\text{£}250,000 \text{ capital employed} \times 0.2) + \text{£}100,000 \text{ fixed costs}]$$

$$\div 3,000 \text{ units} = \text{£}50 \text{ per unit}$$

$$\text{Transfer price} = \underline{\text{£}90} \text{ per unit } (\text{£}50 \text{ contribution} + \text{£}40 \text{ variable costs})$$

(b) (i) Break-even sales units:

$$(\text{£}100,000 \text{ fixed costs} \div \text{£}50 \text{ per unit contribution}) = \underline{2,000} \text{ units}$$

(ii) Profit at 2,800 units:

$$[2,800 \text{ units @ } \text{£}50 \text{ contribution}] - \text{£}100,000 \text{ fixed costs} = \underline{\text{£}40,000}$$

(c) Units to be sold:

$$\text{Contribution per unit} = \text{£}45 (\text{£}85 - \text{£}40)$$

$$\text{Required total contribution} = \text{£}140,000 [(\text{£}250,000 \times 0.16) + \text{£}100,000]$$

$$\text{Required sales} = \underline{3,111} \text{ units } (\text{£}140,000 \div \text{£}45)$$

(d) Residual income:

$$= [3,000 \text{ units} \times (\text{£}90 - \text{£}40)] - 100,000 - (\text{£}250,000 \times 0.12)$$

$$= \underline{\text{£}20,000}$$

QUESTION 5

A company manufactures and sells a single product. Budgeted data per unit of the product is:

	£ per unit
Selling price	8.50
Variable cost	3.70
Fixed production overhead	2.90

The above fixed production overhead absorption rate is based on budgeted production of 12,000 units per period. Budgeted non-production overhead (all fixed) is £16,800 per period.

Actual sales and production for two periods has been:

	Period 1	Period 2
Sales	11,600 units	12,400 units
Production	12,000 units	12,300 units

There was no stock at the start of Period 1. The selling price, unit variable costs and total fixed costs were as per budget in both periods.

REQUIRED

- (a) Prepare profit statements, using absorption costing, showing the actual results for each of the two periods. (7 marks)

The company wishes to compare the results reported in (a) above with those that would be reported using marginal costing.

REQUIRED

- (b) Prepare profit statements, using marginal costing, showing the actual results for each of the two periods. (7 marks)
- (c) Explain fully why the profits reported in parts (a) and (b) differ. Calculations are required to support your explanation. (6 marks)

(Total 20 marks)

Model Answer to Question 5

(a) Profit statement: absorption costing

	Period 1	Period 2	
	£	£	
Sales	98,600	105,400	
Production cost of sales	76,560	81,840	(sales units @ £6.60)
less overhead over-absorption	<u> </u>	<u>870</u>	(300 units @ £2.90)
	76,560	80,970	
Gross profit	<u>22,040</u>	<u>24,430</u>	
Non-production overheads	16,800	16,800	
Net profit	<u>5,240</u>	<u>7,630</u>	

(b) Profit statement: marginal costing

	Period 1	Period 2	
	£	£	
Sales	98,600	105,400	
Variable cost of sales	42,920	45,880	(sales units @ £3.70)
Contribution	<u>55,680</u>	<u>59,520</u>	
Fixed overheads:			
Production	34,800	34,800	(12,000 units @ £2.90)
Non-production	<u>16,800</u>	<u>16,800</u>	
	51,600	51,600	
Net profit	<u>4,080</u>	<u>7,920</u>	

(c) Profit difference: Period 1 £1,160 (absorption higher); Period 2 £290 (marginal higher)

Profit differences are due to the fact that fixed production overhead is included in stock under absorption costing and only charged against profit when goods are sold, whereas under marginal costing fixed production overhead is charged against profit in the period in which the resources are consumed.

In Period 1, finished goods stock increased and thus absorption costing reported a higher profit than marginal costing (400 units @ £2.90 = £1,160).

In Period 2, finished goods stock decreased and thus absorption costing reported a lower profit than marginal costing (100 units @ £2.90 = £290).

QUESTION 6

The following are the budget and actual figures for a period:

	£	£	
Budget: Sales:		260,000	(20,000 units @ £13.00)
Production: 20,000 units			
Production costs:			
Direct materials	61,200		(12,000 kg @ £5.10)
Direct labour	69,700		(8,200 hours @ £8.50)
Fixed overhead	<u>48,000</u>		(20,000 units @ £2.40)
		<u>178,900</u>	
Gross profit		<u>81,100</u>	
Actual: Sales		257,800	(19,600 units)
Production: 20,400 units			
Production costs:			
Direct materials	62,496		(12,440 kg)
Direct labour	70,227		(8,262 hours)
Fixed overhead	<u>48,160</u>		
	180,883		
Increase in stock (at standard)	<u>(7,156)</u>		
		<u>173,727</u>	
Gross profit		<u>84,073</u>	

No raw material or work-in-progress stock is held.

REQUIRED

- (a) Calculate any **six** variances (**NB not** total variances eg total direct material variance). (15 marks)
- (b) Suggest a possible reason for any **three** of the variances. (**NB one** reason for each of the three variances is required). (5 marks)

(Total 20 marks)

Model Answer to Question 6

(a) Variances:

Eight variances may be calculated (any six required).

Sales variances:

Sales volume profit: £1,622 adverse [(20,000 – 19,600 units) × (£81,100 ÷ 20,000 units)]

Selling price: £3,000 favourable [£257,800 – (19,600 units @ £13.00)]

Cost variances:

Direct material price: £948 favourable [£62,496 – (12,440 kg @ £5.10)]

Direct material usage: £1,020 adverse [(20,400 units × 0.6) – 12,440 kg] @ £5.10

Direct labour rate: Nil [£70,227 – (8,262 hours @ £8.50)]

Direct labour efficiency: £867 favourable [(20,400 units × 0.41) – 8,262 hours] @ £8.50

Fixed production overhead expenditure: £160 adverse (£48,160 – £48,000)

Fixed production overhead volume: £960 favourable [(20,400 – 20,000 units) @ £2.40]

NB The eight variances total £2,973 favourable which reconciles the budgeted profit with the actual profit (£81,100 + £2,973 = £84,073).

(b) Possible reasons for variances:

- eg Direct material price (favourable): lower quality material than standard
- Direct material usage (adverse): higher wastage than standard due to below standard quality
- Direct labour efficiency (favourable): positive effect of training/supervision
- There is no direct labour rate variance as the actual rate paid is the same as the standard rate