CIMA

Management Level Paper

P2 – Performance Management
September 2013 examination

Examiner's Answers

Note: *Some of the answers that follow are fuller and more comprehensive than would be expected from a well-prepared candidate. They have been written in this way to aid teaching, study and revision for tutors and candidates alike.*

These Examiner's answers should be reviewed alongside the question paper for this examination which is now available on the CIMA website at www.cimaglobal.com/p2papers

The Post Exam Guide for this examination, which includes the marking guide for each question, will be published on the CIMA website by early October at www.cimaglobal.com/P2PEGS

SECTION A

Answer to Question One

Rationale

The question examines candidates' knowledge and understanding of the learning curve, and how this is linked to sensitivity analysis.

The learning outcomes tested are:

Part (a) A2 (d), *analyse the impact of uncertainty and risk on decision models based on CVP analysis.*

Parts (b) & (c) B1 (e), *apply learning curves to estimate time and cost for new products and services.*

Suggested Approach

Candidates needed to carefully read the question to understand the data provided, and then answer the three parts of the question which dealt with the learning curve, the sensitivity of the budgeted profit related to a change in the price of materials, and a change in the learning rate.

(a)

Budgeted profit = $30 * 128 = $3,840

Material cost = $38,400

Material price can rise by 10%.

The sensitivity of the budgeted profit for the period to a change in the price per kg of materials is 10%.

(b)

Average time per unit after 128 units have been produced is 20 hours. Therefore:

$20 = a * 0.9^7$ (Alternatively: $20 = a * 128^{(-0.152)}$)
$20 = a * 0.4783$

a = 41.81 hours

The time for the first unit is 41.81 hours

(c)

Labour cost can rise by $3,840. Therefore labour hours can increase by 384 hours.

Current labour hours = 20 * 128 = 2,560. Therefore labour hours can increase to 2,944 hours.

This would give an average time per unit for 128 units of 23 hours.

Calculation of learning rate that would give an average time of 23 hours for 128 units is:

$23 = 41.81 * r^7$
$0.5501 = r^7$
$r = 0.9182$
The budgeted learning rate was 90%. The rate can decrease to 91.82%.
Sensitivity to a change in the learning rate = 0.0182/0.9 = 2.02%

Answer to Question Two

The question examines candidates' knowledge and understanding of variance analysis in relation to fixed production overheads and material handling costs.

The learning outcome tested is B1 (f), *apply the techniques of activity-based management in identifying cost drivers/activities.*

Suggested Approach

Candidates needed to understand what was required in relation to the data given. In part (a) two fixed overhead variances needed calculating and in part (b) two variances needed calculating that related to material handling costs.

(a)

(i)

Fixed production overhead expenditure variance = Actual – budget = $310,000 - $300,000 = $10,000 adverse.

(ii)

Fixed production overhead volume variance = Budget – absorbed = $300,000 – (1,600 * $200) = $20,000 favourable.

(b)

The cost driver for the materials handling activity would be "material shipments". Analysis of the budgeted figures shows that the expected activity level is that one shipment should be 4 tonne and each shipment should cost $800.

(i)

85 shipments should cost 85 * $800 = $68,000
85 shipments did cost $69,000
Therefore the materials handling shipment expenditure variance is $1,000 adverse

(ii)

348 tonne of materials should have required 87 shipments but actually only needed 85 shipments. This is two shipments 'favourable'.

The materials handling shipment efficiency variance is 2 * $800 = $1,600 favourable

Answer to Question Three

Rationale

The question examines candidates' knowledge and understanding of activity based costing (ABC) and the linkage between cost control and responsibility accounting in relation to the ABC hierarchy of activities.

The learning outcome tested is C1 (c), *identify controllable and uncontrollable costs in the context of responsibility accounting and explain why uncontrollable costs may or may not be allocated to responsibility centres.*

Suggested Approach

Candidates needed to carefully read the question to fully understand what was required. The requirement revolved around ABC but applied particularly to the context in which the question was set. A detailed discussion of the characteristics of ABC was not required.

Unit level activities

These would traditionally have been classified as variable costs and given the direct nature of these costs no improvements can be made to the linkage between cost control and responsibility accounting. Analysis through variances such as the materials usage variance and the materials price variance identify areas of responsibility.

Batch level activities

Some activities, for example machine set ups, consume resources in proportion to the number of batches produced rather than in proportion to the number of units produced. The cost driver for the set up activity is the request for the set up and not the number of units that are in the production run. Therefore a link can be established to the manager who has requested the set up and the appropriate charge made to the manager/product. Under a traditional system the charge would have been made based on, for example, the number of machine hours consumed by the production run and would have been considered as part of the general production overhead. It is in this area that ABC has the greatest impact: cost pools related to activities are identified and appropriate cost drivers are used to charge costs to the manager/product responsible for initiating the activity.

Product sustaining activities

These activities are performed to enable different products (or services) to be produced and sold (or performed). The resources consumed are independent of how many units or batches are produced although there may be some 'stepped costs' e.g. advertising. The costs can be identified directly with each product and the decision to incur them. The linkage to cost control and responsibility accounting should not be any different under ABC than traditional costing.

Facility sustaining activities

Even within an ABC system it is accepted that some costs simply relate to "being in business" and therefore cannot be directly linked with a specific product or service (examples include buildings maintenance and security). The linkage to cost control and responsibility accounting would not be any different under ABC than traditional costing.

Answer to Question Four

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Rationale

The question examined candidates' knowledge and understanding of feedforward and feedback controls in a budget setting.

The learning outcome tested is C1 (a), *explain the concepts of feedback and feed-forward control and their application in the use of budgets for planning and control.*

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Suggested Approach

Candidates needed to read the requirement carefully, paying particular attention to the verb used. As stated in the requirement, a budgeting system should have been used in explaining points.

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Feedback control involves monitoring outputs achieved against desired (budgeted) outputs and taking whatever corrective actions are necessary if a deviation (i.e. a variance) exists. Feedback control establishes why there is a difference. If it is a negative situation steps must be taken to get operations back on track. If it is a positive position the reason must be understood so this favourable position can be maintained. Feedback is backward looking and is reactionary.

With feedforward control, instead of actual outputs being compared and controlled against desired outputs, predictions are made of what outputs are expected. If these predictions differ from the budgeted target, control action is taken immediately in order to minimise the differences. The objective is for control to be achieved before any deviations from the desired outputs actually occur.

With feedforward control likely steps are taken to prevent predicted variances, whereas with feedback actual errors are identified after the event and corrective action is taken to implement future actions to achieve the desired results, i.e. to get back on track. Feedforward is forward looking and is proactive.

A major limitation of feedback control is that errors are allowed to occur. This is not a significant problem (although it is obviously better if no errors occur) when there is a short term lag between the occurrence of an error and the identification and implementation of corrective action. Feedforward control is therefore preferable when a significant time lag occurs.

The budgetary planning process is a feedforward control system. To the extent that outcomes fall short of what is desired, alternatives are considered until a budget is produced that is expected to achieve what is desired. The comparison of actual results with budget, in identifying variances and taking remedial action to ensure that future outcomes will conform to budgeted outcomes is an illustration of a feedback control system. Thus accounting control systems consist of both feedback and feedforward controls.

Answer to Question Five

Rationale

The question examines candidates' knowledge and understanding of the modern business environment in relation to outsourcing customer liaison and product support to "inbound call centres"

The learning outcome tested is B1 (j), *discuss the concept of the value chain and the management of contribution/profit generated throughout the chain.*

Suggested Approach

Candidates needed to carefully read the question and fully appreciate what was required in relation to the scenario described. An understanding of the modern business environment was required and the main principles associated with outsourcing customer liaison and support service operations.

A key feature of the modern business environment is that in order to compete organisations must recognise the need to achieve customer satisfaction. Organisations now operate in a global economy in which customers and competitors come from all over the world. Customers have far greater choice than ever before and are demanding ever improving levels of service in terms of cost, quality, reliability and delivery.

Advantages of outsourcing customer liaison and product support include:

- Reduction in workload and non-core activities: this would allow the organisation to focus their time and resources on core activities and thereby increase the overall productivity.

- 24x7 support: most call centres offer a 'round the clock' service and therefore customers can obtain answers to enquiries outside of normal business hours.

- Cost savings: training, development and technology investment costs will be the responsibility of the call centre. It is claimed that call centres can save organisations up to 70% of the overall cost of setting up, running and maintaining an in-house call answering centre.

- Changing cost structure: what was previously viewed as a fixed cost is converted to variable cost and therefore impacts on operational costs and risks.

Disadvantages of outsourcing the service include:

- The time and effort needed to ensure that the correct provider is chosen.

- Resentment by customers: there is a chance that customers will view the use of a third party as a sign that the organisation does not view customer support as being important.

- The possible loss of control over the quality of the service being received by callers. A close relationship should be built up with the call centre to ensure that all operatives have the detailed knowledge necessary to deal with callers.

Answer to Question Six

Rationale

The question examines candidates' knowledge and understanding of marginal costing principles, in particular as they relate to a limiting factor situation, and when a marginal contribution approach is required to reach an optimum position. An understanding of shadow pricing was also required.

The learning outcomes tested are:

Part (a) A2 (b), *interpret variable/fixed cost analysis in multiple product contexts to break-even analysis and product mix decision making, including circumstances where there are multiple constraints and linear programming methods are needed to identify 'optimal' solutions.*

Part (b) A2 (c), *discuss the meaning of 'optimal' solutions and demonstrate how linear programming methods can be employed for profit maximising, revenue maximising and satisfying objectives.*

Part (c) A3 (a), *apply an approach to pricing based on profit maximisation in imperfect markets.*

Suggested Approach

Part (a)

Candidates needed to carefully read the question to gain a full understanding of what was required. Firstly, there was a need to identify the limiting factor, and then maximise the profit by making best use of the limiting factor.

Part (b)

This part required candidates to calculate the shadow prices for labour hours using the outcome of part (a).

Part (c)

Required candidates to understand the data provided and to use it to show a revised optimum production position by use of a marginal contribution approach.

(a)

	X	Y	Z	Total	Available
Labour hours per unit	0.5	1.5	1.5		
Machine hours per unit	1	2	0.75		
Production and sales (units)	10,000	6,000	10,000		
Labour hours needed for budget	5,000	9,000	15,000	29,000	12,500
Machine hours needed for budget	10,000	12,000	7,500	29,500	30,000

From the above table it can be seen that labour hours are the limiting factor.

	X	Y	Z
Selling price ($ per unit)	24	41	42
Variable cost ($ per unit)	8	8	14
Contribution per unit ($)	16	33	28
Labour hours per unit	0.5	1.5	1.5
Contribution per labour hour ($)	32.00	22.00	18.67
Rank	1st	2nd	3rd

	X	Y	Total
Output (units)	10,000	5,000	
	$	$	$
Revenue	240,000	205,000	445,000
Variable costs	80,000	40,000	120,000
Contribution	160,000	165,000	325,000
Fixed costs			402,000
Loss			(77,000)

(b)

The shadow price of labour is $22 per hour for the next 1,500 hours (up to a total 14,000 hours) and then $18.67 per hour for the subsequent 15,000 hours (up to a total of 29,000 hours). After that the shadow price will be zero because of the lack of demand.

(c)

(i)

It is necessary to compare the marginal contribution earned from each batch and recognise the labour hours used.

Product X

Sales	Price	Cont per unit	Total cont	Marginal contribution	Marginal cont/lhr	Hours used	Rank	Cumulative hours
	($)	($)	($)	($)	($)			
2,000	28	20	40,000	40,000	40	1000	1	1,000
4,000	27	19	76,000	36,000	36	1000	2	2,000
6,000	26	18	108,000	32,000	32	1000	4	6,000
8,000	25	17	136,000	28,000	28	1000	5	7,000
10,000	24	16	160,000	24,000	24	1000	7	11,000
12,000	23	15	180,000	20,000	20	1000	8	12,000
13,000	22	14	182,000	2,000	4	500	9	12,500

Product Z

Sales	Price	Cont per unit	Total cont	Marginal contribution	Marginal cont/lhr	Hours used	Rank	Cumulative hours
	($)	($)	($)	($)	($)			
2,000	66	52	104,000	104,000	34.67	3000	3	5,000
4,000	60	46	184,000	80,000	26.67	3000	6	10,000
6,000	54	40	240,000	56,000	18.67			
8,000	48	34	272,000	32,000	10.67			
10,000	42	28	280,000	8,000	2.67			
12,000	36	22	264,000	-16,000	-5.33			

The revised optimum production plan is 13,000 X and 4,000 Z

(ii)

The total contribution from the revised plan is (13,000 * $14) + (4,000 * $46) = $366,000

Answer to Question Seven

Rationale

The question examines candidates' knowledge and understanding of transfer pricing in a typical business context. The question also considers the tax implications associated with the transfer policy presently in use.

The learning outcomes tested are:

Part (a) (i) D3 (c), *discuss the likely consequences of different approaches to transfer pricing for divisional decision making, divisional and group profitability, the motivation of divisional management and the autonomy of individual divisions.*

Part (a) (ii) D3 (d), *discuss in principle the potential tax and currency management consequences of internal transfer pricing policy.*

Part (b) D3 (c), *discuss the likely consequences of different approaches to transfer pricing for divisional decision making, divisional and group profitability, the motivation of divisional management and the autonomy of individual divisions.*

Part (c) D3 (a), *discuss the likely behavioural consequences of the use of performance metrics in managing cost, profit and investment centres.*

Suggested Approach

A careful read through the scenario was essential to understand what was required. In part (a) a clear statement was required to show the profit for each division using the present pricing policy. In part (b) a statement was required using an opportunity cost approach to transfer pricing.

(a)

(i)

	Division P	Division R	Working
	$	$	
Internal transfer	4,812,500		1
External sales	4,125,000	10,000,000	2
Total sales	8,937,500	10,000,000	
Internal transfers		4,812,500	
Variable costs	7,000,000	1,250,000	3
Fixed costs	1,500,000	1,000,000	
Profit before tax	437,500	2,937,500	
Tax	196,875	734,375	
Profit after tax	240,625	2,203,125	

Working	
1	625T * $7,000 * 1.1
2	P: 375T * $11,000 R: 500T * $20,000
3	P: 1,000T * $7,000. R: 625T * $2,000

(ii)

The inter-company transfer price for processed coffee beans is equivalent to $7,700 per tonne. This is significantly below the market price for processed coffee beans of $11,000 per tonne and the difference of $3,300 per tonne equates to $2,062,500 on the 625tonnes transferred to Division R. Setting the transfer price at $7,700 compared to $11,000 has the

effect of reducing profit before tax at Division P by $2,062,500 and increasing profit before tax at Division R by the same amount.

This will be of particular interest to tax authorities as HPR are moving $2,062,500 of taxable profit from country Y (where a tax rate of 45% is operation) to country Z (where a lower tax rate of 25% is in operation) by the use of their chosen transfer price for processed coffee beans. Country Y's tax authorities would argue the transfer price of $7,700 does not represent an arm's length transaction as it is below $11,000 per tonne, the market price for processed coffee beans. The tax authorities in Country Y may require that an arm's length transfer price be introduced to ensure tax is not avoided in that country.

(b)

	Division P	Division R	Working
	$	$	
Internal transfer	6,075,000		1
External sales	4,125,000	10,000,000	2
Total sales	10,200,000	10,000,000	
Internal transfers		6,075,000	
Variable costs	7,000,000	1,250,000	3
Contribution	3,200,000	2,675,000	

Working	
1	(200T * $7,000) + (425T * $11,000)
2	P: 375T * $11,000 R: 500T * $20,000
3	P: 1,000T * $7,000. R: 625T * $2,000

(c)

Two issues that could arise by the imposition of a transfer pricing policy on divisional managers are:

1. One of the purposes of decentralisation is to allow managers to exercise greater autonomy. There is little point in granting autonomy and then imposing transfer prices. Such imposition may make the managers feel that they are deemed to be incompetent and consequently undermine their confidence.

2. If the performance measure for the divisional managers is based on the profits of their respective divisions it is essential that the transfer pricing policy allows an equitable portrayal of the performance of each division to be presented. Managers should be held responsible for what they can control; they should not be held responsible for profits or losses generated by an imposed transfer price. One way to overcome this problem is to use "dual prices".