CIMA

Management Level Paper

P2 – Performance Management
March 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 April at www.cimaglobal.com/P2PEGS

SECTION A

Answer to Question One

Rationale

The question examines candidates' knowledge, understanding and application of the learning curve when establishing the total cost of a product.

The learning outcome tested is B1 (e) *apply learning curves to estimate time and cost for new products and services.*

Suggested Approach

Candidates needed to carefully read and absorb the data provided and use the learning curve formula provided to establish the time taken to produce the 32nd batch.

Part (b) required candidates to use the data provided in the question, together with the output from part (a), to calculate the selling price of the final 500 units that would allow a certain level of profit to be earned.

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(a)

	Output	
	31 batches	32 batches
Cumulative average time ($y=ax^{-.152}$)	296.6764 hours	295.2482 hours
Total time (= c.a.t. * output)	9,196.9690 hours	9,447.9410 hours

Time for 32nd batch = 9,447.941 – 9,196.969 = 250.972 hours

(b)

Workings: labour cost of 40 batches

Labour hours for 32 batches	9,447.941
Labour hours 33 to 40 batches =250.9723 * 8	2,007.778
Total labour hours for 40 batches	11,455.719
Total labour cost = 11,455.719 * $24	$274,937

Total cost of 40 batches

	$
Labour	274,937
Other variable costs	240,000
Fixed costs	130,000
Total cost	644,937

Total revenue needed to earn target profit of $150,000 = $794,937

Revenue from 3,500 units = 3,500 * $215 = $752,500

Revenue needed from final 500 units = $42,437

Selling price per unit = $84.88

Examiner's note: Alternative ways of presenting the figures were/are acceptable

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Answer to Question Two

Rationale

The question examines candidates' knowledge and understanding of the value chain associated with a manufacturing company, and how the value chain relates to the four types of quality cost.

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

Suggested Approach

Carefully read the question and understand the scenario to which the question relates.

In part (a) candidates simply had to state the primary activities in the value chain of a manufacturing company.

Part (b) required candidates to identify the four types of quality cost and explain how each type of cost could be reduced. Candidates also needed to identify the primary activity in the value chain to which each item of quality cost related.

(a)

> Inbound logistics
> Operations
> Outbound logistics
> Marketing and sales
> Service

(b)

Prevention – operations: preventative maintenance and checking of the calibration of machinery. This would reduce the number of potentially faulty products being produced and therefore reduce guarantee claims.

Appraisal – inbound logistics: reduce costs of incoming inspections by building close links with suppliers and getting them to adopt TQM. If suppliers can guarantee their quality then inbound inspections could be eliminated.

Internal failure - operations: reduce costs of re-works by training employees on a continual basis e.g. quality circles. This would reduce failure costs and also improve quality.

External failure - service: design quality into the product to try to prevent guarantee claims and therefore the cost of servicing/repairing the product.

Answer to Question Three

Rationale

The question examines candidates' knowledge and understanding of how traditional absorption and allocation of costs differs from activity based costing, and of how ABC could help increase a company's profit.

The learning outcome tested is B1 (l), *analyse direct customer profitability and extend this analysis to distribution channel profitability through the application of activity-based costing ideas.*

Suggested Approach

Candidates needed to carefully read and understand the setting for this question. In part (a) candidates simply needed to explain how absorption and allocation of costs differs in activity based costing compared to traditional absorption costing.

In part (b) candidates were required to explain how the introduction of ABC could help to increase the profits of the company. An understanding of ABC related to Direct Product Profitability and Customer Profitability was required.

(a)

In traditional absorption costing costs are allocated to production and/or service departments and are then absorbed into products by the use of overhead absorption rates. The absorption rate base will be chosen to reflect the characteristics of the department in an attempt to establish causality and equity, and therefore labour hours or machine hours are typically used.

In activity based costing costs are allocated to cost pools. The costs allocated to a cost pool may be from different departments but the reason behind the grouping is that the costs will be caused by a particular type of activity i.e. a cost driver. The cost per driver can then be calculated and used to charge costs to products and/or service departments by looking at the number of times they give rise to the activity.

(b)

ABC can be used to identify the activities that are causing costs. The activities could be related to products and/or customers.

Direct Product Profitability necessitates that costs are attributed to the products that cause them. Activity based costing can help with this process by tracing costs through the identification of cost drivers which may be driven by specific products. Given this information PQ can investigate selling prices, inventory, display space, distribution costs and other factors that determine the profitability of each product or product group. For example the costs of Cutting Bay could be allocated to the products that are taken to the bay.

Customer Profitability Analysis is the "analysis of the revenue streams and service costs associated with specific customers or customer groups" (CIMA terminology). Activity based costing would enable PQ to do this. Activity based costing will lead to the identification of cost drivers and these could be traced to customers. For example, to identify which type of customers take advantage of the free delivery service.

When costs are traced to products/services/customers it will allow PQ to see the profits from each product and/or customer group and then make informed decisions about selling prices, products sold, inventory levels, etc.

Answer to Question Four

Rationale

The question examines candidates' knowledge, understanding and application of variance analysis.

The learning outcome tested is C2 (c), *evaluate performance using fixed and flexible budget reports.*

Suggested Approach

Carefully read and understand the level of variance analysis required to reconcile the budgeted variable cost with the actual variable cost. A clearly labelled statement displaying the variances was required.

Reconciliation Statement for February

	$ Fav	$ Adv	$	
Budgeted variable production cost			148,500	
(1,100 units)				
Planning variance (labour rate)			2,475	adv
Revised budgeted variable production cost			150,975	
Materials price		11,540		
Materials usage	8,300			
Labour rate		2,065		
Labour idle time		4,347		
Labour efficiency	567			
Variable overhead expenditure		3,000		
Variable overhead efficiency	1,000			
Total variances	9,867	20,952	11,085	adv
Actual variable production cost			162,060	

Answer to Question Five

Rationale

This question examines candidates' knowledge and understanding of the non-financial perspectives of the balanced scorecard.

The learning outcome tested is C3 (c), *compare and contrast traditional approaches to budgeting with recommendations based on the 'balanced scorecard'.*

Suggested Approach

Candidates needed to read the question carefully and understand the context in which this question is set.

An objective and suitable performance measure was required for each of the three non-financial perspectives.

Examiner's note: The following is an example of a scorecard. There are many that would be acceptable. The key element is that they must fit with the vision and strategy of the laboratory.

Four perspectives:

- Financial
- Internal Processes
- Learning and growth
- Customer

Internal processes

Objective: to provide accurate results

Performance measure: percentage of spoiled tests. Reason: need to ensure accuracy and lack of contamination (and achieve external quality benchmark figures)

Learning and growth

Objective: to have highly qualified staff trained in the latest techniques

Performance measure: number of staff training days. Reason: provides a measure of continual professional development

Customer

Objective: to provide results that allow our customers to meet the stated minimum period for treatment

Performance measure: reporting time for each type of test. Reason: specific tests have specific treatment windows and therefore 'turn around' time is important for the doctors.

Answer to Question Six

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Rationale

The question examines candidates' knowledge and understanding of linear programming.

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

Part (b) required candidates to understand and evaluate the position if skilled labour and machine hours were not constrained.

Part (c) required candidates to identify and explain two major factors that should be considered before deciding to lease the machine.

Suggested Approach

Candidates needed to read the question carefully and gain a full understanding of the data presented and the specific requirements of each part of the question.

Part (a) required the construction of a graph to identify the optimal production plan, which would include the following actions.

- Define the unknown
- Formulate the constraints
- Formulate the objective function
- Graph the constraints and objective function
- Manipulate the objective function to find the optimal feasible solution.

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(a)

Workings for graph:

Iso-contribution line: $35E + 66R$

Constraints:
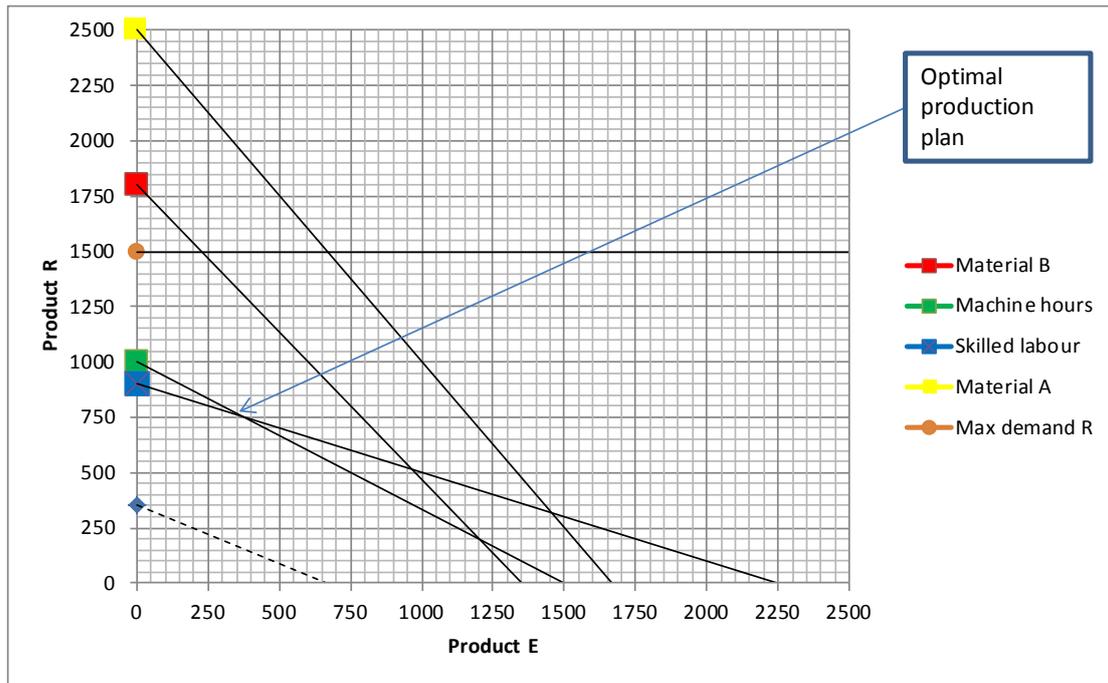Direct material A: $3E + 2R \leq 5{,}000$
Direct material B: $4E + 3R \leq 5{,}400$
Machine hours: $2E + 3R \leq 3{,}000$
Skilled labour: $2E + 5R \leq 4{,}500$
Demand: $0 \leq R \leq 1{,}500$

From the graph, it can be seen that the two binding constraints are those relating to machine hours and skilled labour. The solution (from the graph) is to produce 375 units of E and 750 units of R.

(b)

By inspecting the graph it can be seen that:

The extra labour would change the production plan to 0E and 1,000R

This would earn a contribution of $66,000 if the labour was paid $10 per hour but that rate only applies for 4,500 hours. The additional cost for the extra 500 hours will be $1,000 + (500 * $4) = $3,000. Therefore the contribution from 1000 R will be $63,000.

If the machine is hired the optimal production plan would be 225E and 1,500 R. At this level of output, 7,950 labour hours are needed.

If labour was paid $10 per hour the contribution would be $106,875

Extra labour cost = $1,000 + (3,450 * $4) = $14,800

Therefore contribution from 225E and 1,500R = $92,075

Maximum that should be paid next month to lease the machine is $29,075

(c)

Many factors would earn marks. Examples include:

Machine: the new machinery would increase the capacity to 5,000 machine hours. The production plan would require 4,950 hours and is therefore close to the capacity. If downtime was more than 50 hours the plan would not be achievable.

Labour: is it possible to supervise the additional labour given the current staff? The extra labour is an increase of 77% on current levels. Will there be any incremental overhead costs associated with the increased labour?

Labour: is it possible to recruit more labour without using the agency? Would the existing staff be prepared to work overtime? How will they feel about being paid $4 per hour less than the agency staff?

Management control: the revised plan requires a lot more resources. Can the existing staff control the extra resources?

Product E: if demand is unlimited at $99 per unit, could the selling price be increased?

Answer to Question Seven

Rationale

The question examines candidates' knowledge and understanding of performance measurement and aspects of capital investment, including calculations and a discussion of Return on Capital Employed.

The learning outcomes tested are:

Part (a) D2 (b), *discuss revenue and cost information in appropriate formats for profit and investment centre managers, taking due account of cost variability, attributable costs, controllable costs and identification of appropriate measures of profit centre contribution.*

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

Suggested Approach

Candidates needed to carefully read the question to gain a full understanding of what was required.

Part (a) required candidates to compare the performance of two divisions for two accounting periods, and comment on the performances by use of appropriate measures e.g. ROCE

Part (b)(i) required candidates to calculate the net present value of the investment described in the scenario.

Part (b)(ii) required a comparison of the ROCE of one of the divisions before and after the investment, and a discussion of the results.

(a)

	2012			2011	
	Eastern	**Western**		**Eastern**	**Western**
ROCE %	38.0	41.7		29.3	26.7
Staff costs/revenue %	63.9	57.7		62.1	58.2
Other operating costs/revenue %	25.6	27.2		26.3	27.6
Asset turnover	3.6	2.8		2.5	1.9
Operating profit/revenue %	10.6	15.1		11.6	14.2
Depreciation $'000	250.0	300.0		250.0	300.0
Op costs-depreciation $'000	210.0	375.0		250.0	320.0
Op costs-depreciation/revenue %	11.7	15.1		13.2	14.2
Revenue per member $	265	267		266	267
Staff costs per member $	169	154		165	156

In 2011 the Eastern Division generated the higher ROCE and the Managing Director of that division would have received the bonus. The revenue for the Eastern division was lower than that of the Western Division but so was its capital employed. This is because it had a lower investment in non-current assets and its assets are older (assuming that all assets in each particular division were acquired at the same date).

Revenue at the Eastern division has fallen by 5.3% between 2011 and 2012. As revenue per member of $266 has been maintained at broadly the same level during the period it can be concluded that the decline in revenue is due to the fall in number of members. The opposite is true for the Western division, as revenue has increased by 10.2% over the period. Revenues per member are in line with the Eastern division at $267 and have been maintained over the period.

The operating profit has fallen over the period at the Eastern division due to a fall in revenue and also less effective cost management with operating profit margins decreasing from 11.6% to 10.6%.

Conversely, in the Western division, the operating profit margin has increased from 14.2% to 15.1%. However further information can be obtained from a deeper analysis of the figures:

- Staff expenses as a percentage of revenue have increased for the Eastern Division but decreased for the Western Division. Given that revenue is almost directly linked to the number of members it could be argued that this is to be expected given that it is highly likely that many of the staff costs are fixed.
- Operating costs as a percentage of revenue have fallen for both divisions but if depreciation is excluded it can be seen that they have increased for the Western Division.

The Managing Director of the Western Division would earn the bonus in 2012.

(b) (i)

	Year	$'000	Disc factor	PV $'000
Investment	0	-800	1.000	-800
Cash inflow	1-5	234	3.352	784
Sales of assets	5	350	0.497	<u>174</u>
NPV				<u>**158**</u>

Note: 234 = 144 + (450/5)

The NPV of the project is $158,000.

(ii)

The NPV of the investment is positive and therefore this investment should have been made. However the Managing Director of the Western Division will want to earn a bonus and knows that this is determined by the ROCE of the division. Without the investment the ROCE for the Western Division would rise to 41.7% from 26.7% the previous year.

With the investment the operating profit for the Western Division would rise to $519,000 and the capital employed to $1,610,000. This would give a ROCE of 32.2% ($519,000/$1,610,000). Although this is above the 2011 figure it is significantly below what it would be if the investment was not made. Consequently the Managing Director of the Western Division would make a decision that is not in the best interests of the group and would reject an investment that should be undertaken as it has a positive NPV.

ROCE is not an appropriate measure for several reasons: it is based on profit and will increase without any effort being made due to the effects of depreciation on the capital base, and can be distorted by accounting policies. As can be seen it also focuses on the short term: the Divisional Manager focussed on the immediate impact. Another major criticism of ROCE is that it ignores the time value of money.