Management Level Paper

P2 – Performance Management
November 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 February at www.cimaglobal.com/P2PEGS

SECTION A

Answer to Question One

Rationale

The question examines candidates' knowledge and understanding of the learning curve. 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 the question and use the information to relate their answers to the scenario. In part (a) candidates needed to calculate the time required to produce the 64th batch and the variable cost. The time for batch number 64 was required; candidates then needed to apply the variable costs to calculate the cost of the batch rather than the cost of a unit.

In part (b) candidates were required to give three conditions that must exist in the production process of Product Z for the learning curve effect to be realised. Full explanations, relating the conditions to Product Z production, were needed to score the highest marks.

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(a) (i)

Cumulative average time for first 64 batches

$y = ax^b$	x = 64	y = 11.03 hours
a = 15 hours	b = -0.074	

Total time for first 64 batches

11.03 hours * 64 = 705.92 hours

Cumulative average time for first 63 batches

$y = ax^b$	x = 63	y = 11.04 hours
a = 15 hours	b = -0.074	

Total time for first 63 batches

11.04 hours * 63 = 695.52 hours

Time for batch 64 = 705.92 - 695.52 = 10.40 hours

(ii)

	$	Working
Labour	260	1
Material	520	2
Variable overhead	52	3
Total variable cost	832	

Workings

1 10.40 hours x $25 per hour

2 $52 * 10 units per batch

3 10.40 hours x $5 per hour

(b)

In order for the learning curve effect to be realised at PWR a number of conditions must be satisfied.

The production process must be labour intensive. The Product Z production process should have direct involvement from the company's labour force rather than being largely automated. The process must be labour intensive in order for the learning curve effect to apply.

The production process should be complex in its composition. Complicated production processes will allow scope for learning. This seems to be the case for Product Z with the first batch expected to take 15 hours.

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The production process should be continuous without extended stoppage periods. The reduction in production time stated by the learning curve effect can only be achieved if production occurs without significant breaks. A prolonged stoppage in production risks the learning from previous units being lost and production time increasing back towards the time for the first unit.

There should be a low turnover of production labour. A high number of production staff leaving the organisation will mean that new staff need to be employed. These new staff members will have no experience of the production at PWR and consequently take a longer time to produce units than more experienced PWR employees. The steady state production time per unit of Product Z will be achieved once all production staff have sufficient experience to realise the learning effect.

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Answer to Question Two

Rationale

The question examines candidates' knowledge and understanding of target costing.
The learning outcome tested is B1(h), *explain how target costs can be derived from target prices and the relationship between target costs and standard costs.*

Suggested Approach

It was important for candidates to carefully read the question in order to calculate the cost of producing and delivering a Model S car. Part (a) required candidates to use the cost driver information in the notes to calculate both the production line and delivery cost for a Model S car.
In part (b) candidates should use the information in the question, for example highlighting the limited production numbers of Model S and the importance of using target costing to achieve the required profit figures.

(a) (i)

Forecast cost	**$**
Labour	5,000
Material	9,500
Overhead	791.75
Total cost	15,291.75

Workings

$4,630,000 / 60,000 annual production line machine hours = $77.17 per machine hour

$77.17 x 6 machine hours for a Model S = $463

Transportation cost

60% delivery related = $1,080,000

40% distance travelled related = $720,000

$1,080,000 / 640 deliveries = $1,687.50 per delivery

$1,687.5 / 10 cars = $ 168.75 per car

$720,000 / 225,000km = $3.20 per km travelled

$3.20 x 50,000km = $160,000

$160,000 / 1,000 Model S cars = $160 per car

(ii)

	$
Target selling price	19,950
Profit margin	25%
Target cost	14,962.50
Forecast cost	15,291.75
Cost gap	**329.25**

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(b)

A target costing approach for the Model S car has significant potential advantages for planning and control at SXL. Model S is a special edition and production numbers will be limited. As such, it is important that revenues and costs are carefully planned to ensure Model S generates the required profit over its short production life.

Target costing is a market focussed approach that bases the target price on customer requirements to achieve a specified level of demand. This market led and price driven approach offers a greater degree of accuracy in profit planning.

The majority of manufacturing cost for model S will be committed at the design stage. Adopting target costing enables cost reductions to be planned before costs are committed whilst ensuring the product still fits the requirements of the customer.

The team based approach to target costing requires staff from all departments at SXL involved in the Model S project to input into the process to close the cost gap. Cost savings are sought in the production of Model S together with transportation efficiency savings in the achievement of the target cost.

Examiner's Note: candidates were required to explain only two advantages.

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Answer to Question Three

Rationale

The question examines candidates' knowledge and understanding of Kaizen costing and Total Quality Management principles when set in a food production environment.
The learning outcome tested is B1(c) *explain the concepts of continuous improvement and Kaizen costing that are central to total quality management.*

Suggested Approach

Part (a) required the explanation of two concepts of Kaizen costing and did not require candidates to relate their answers to the scenario in the question.

Part (b) needed candidates to carefully read through the scenario in order to identify the conditions that must exist for TQM to be successfully implemented at HRS. Citing generic conditions without relevance to the situation described at HRS would earn only limited marks.

(a)

Kaizen costing is a system of cost reduction based upon attaining incremental cost reductions by making small changes in the product or the method of operations.

Kaizen costing is a system of cost reduction rather than cost control. Kaizen goals are often updated monthly and targets set based on achievement of a cost reduction.

Kaizen costing is based on the assumption that the manufacturing process is always able to improve. Perfection is never achieved and the organisation should continually seek to improve its processes and production conditions.

Examiner's Note: only two concepts are required by the question.

(b)

In order for Total Quality Management to be successfully implemented at HRS, the whole organisation must adopt a quality culture. This includes the managing director of HRS. It is imperative that the managing director adopts and espouses the principles of Total Quality Management as the company's ethos will dictate to what extent the philosophy is committed to by the employees of HRS.

HRS must get much closer to its customers. HRS's supermarket customers have reduced their purchases as consumer tastes have changed. HRS must foster and deepen its relationship with supermarkets to understand the customer requirements.

HRS should seek continuous improvement in its production, processes and employees. Production techniques have remained largely unchanged at HRS and production is limited to one type of product. HRS must aim to meet the quality requirements of its customers and not be satisfied with current production techniques.

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Answer to Question Four

Rationale

The question examines candidates' knowledge and understanding of "what if" scenarios and the use of spreadsheets in facilitating these analyses.

The learning outcome tested is C2(b) *evaluate the consequences of "what if" scenarios and their impact on the master budget.*

Suggested Approach

Part (a) required candidates to read the question carefully to understand the method to calculate gross profit. A clear layout and methodical approach to calculations were required to ensure all information in the scenario was incorporated.

Part (b) required an explanation of potential advantages and disadvantages of the use of spreadsheets in developing forecast scenarios. The wording of the requirement should be noted as it was the advantages and disadvantages of the use of spreadsheets that was required and not answers focussing on advantages and disadvantages of developing the scenarios.

(a)

High scenario	*Product L*
Total average balance	$1,683m
Customer lending rate	8.80%
Lending income	$148.104m
Funding rate	4.15%
Funding cost	$69.845m
Gross profit	$78.260m

Low scenario	*Product L*
Total average balance	$1,237.5m
Customer lending rate (7.9%*0.4+5.9%*0.6)	6.70%
Lending income	$82.913m
Funding rate	4.55%
Funding cost	$56.306m
Gross profit	$26.607m

(b)

Scenario analysis using spreadsheets offers users a high degree of flexibility. By splitting the spreadsheet into input, processing and output areas, assumptions can be managed and held separately. This functionality is useful in CHX as a number of key assumptions in the high and low scenarios differ from those in the base case, and the spreadsheet allows their effect to be measured easily.

The flexible nature of the spreadsheet also allows different scenarios to be readily developed. The spreadsheet used for the base scenario can be used to develop high and low scenarios as the processing and output areas and the lending income and cost calculations for CHX, will stay the same and only assumptions in the input area will change.

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However, inaccuracies are potentially difficult to detect in spreadsheets. A developer entering complex formulae into the spreadsheet could make a mistake. As the error in the formula is held in the processing area of the spreadsheet it may not be detected by other users and go unnoticed. The implications of inaccuracies in forecast scenarios are obviously significant for THX, a bank that is part owned by the government.

Answer to Question Five

Rationale

The question examines candidates' knowledge and understanding of pricing based on profit maximisation in imperfect markets and the use of rolling budgets.

The learning outcomes tested are:
Part (a) A3(a) *apply an approach to pricing based on profit maximisation in imperfect markets.*

Part (b) C3(d) *discuss the criticisms of budgeting, particularly from the advocates of 'beyond budgeting' techniques.*

Suggested Approach

Part (a) required candidates to use the relevant formulae to calculate the price at which profit would be maximised. Candidates should note the requirement to 'calculate the revenue' and use the profit maximising price and associated demand to calculate the total revenue.

Part (b) required a discussion of the use of rolling budgets in the planning and management control process at HIJ. This required candidates to discuss advantages and disadvantages of the budgeting approach at HIJ. The frequent changes in the perfume market should have been noted and linked to the advantage of rolling budgets in these specific circumstances.

(a)

To calculate the marginal revenue function the demand function must first be established.

P = a – bx

b = 3 / 10,000 = 0.0003

45 = a - 0.0003*125,000. Therefore, a = 82.50

P = 82.50 – 0.0003x

MR = a – 2bx, MR = 82.50 – 2*0.0003x

Profit is maximised when MR = MC

MC = $21

21 = 82.50 – 2*0.0003x. Therefore x = 102,500

Substitute the value of x into the demand function to get price

82.50 – 0.0003*102,500 = $51.75

Revenue = $51.75 * 102,500 = $5,304,375

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(b)

Rolling budgets are updated each period, usually a month, adding a further month on to the end of the forecast period, usually one year, when the current month has expired. Rolling budgets in HIJ will mean that the frequent changes in the perfume market can be reflected in the company's financial plans. This results in performance management against more meaningful budgets and management able to take better-informed decisions.

However, rolling budgets are time-consuming to prepare. Rather than preparing a fixed budget once for use throughout the following year, a rolling budget is revised each month with an additional month added to the forecast period once the current one has elapsed. The budget process will require a significant amount of administration and input from finance and other department staff.

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SECTION B

Answer to Question Six

Rationale

The question examines candidates' knowledge and understanding of pricing strategies and of relevant costing in the production of a minimum price quotation.

The learning outcomes tested are:

Part (a) A1(a), *discuss the principles of decision-making including the identification of relevant cash flows and their use alongside non-quantifiable factors in making rounded judgements*.

Part (b) A1(c), *discuss the particular issues that arise in pricing decisions and the conflict between 'marginal cost' principles and the need for full recovery of all costs incurred.*

Part (c) A3(b), *discuss the financial consequences of alternative pricing strategies.*

Suggested Approach

Part (a)
Carefully read the question to understand the relevant cost impact of each item of information. For each item, 1 to 9, candidates were required to show the relevant cost along with an explanation of their treatment of the costs. A clear layout and full explanation of cost treatment were required.

Part (b)
Candidates needed to explain two reasons why relevant costing may not be a suitable approach to pricing houses in the longer term and relate their explanation to the scenario.

Part (c)
Justified recommendations were required. The recommendation must be specific and relevance to the innovative environmentally friendly houses produced by DLW explained. Explanations of unrelated pricing strategies would not earn marks.

(a)

	$	Note
Food and drink at meeting	-	1
Material Z	78,000	2
Construction workers	-	3
Engineers	4,485	4
Specialist machine	15,250	5
Windows	1,500	6
Other materials	6,000	7
Fixed overhead	-	8
Profit margin	-	9
Total relevant cost	105,235	

Notes

1) The food and drink costs are sunk. The meeting with the client has already occurred and therefore the costs not relevant.

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2) Material Z is regularly used by DLW. The 550kg currently in inventory will need to be replaced and therefore should be valued at replacement cost. $65 x 550kg = $35,750
The remaining 650kg required for the contract is not owned by DLW and therefore will need to be purchased at the replacement cost. $65 x 650 = $42,250.

   Total relevant cost $78,000

3) The construction workers have spare capacity to complete the work and are employed under a guaranteed wage agreement. Construction workers will be paid whether or not they work on the contract; therefore the cost is not relevant.

4) Engineers are salaried and this is not an incremental cost. However, they are currently at full capacity and do not have time within their normal hours to complete the 90 of hours work required. The engineers' additional time should be valued at opportunity cost.
If overtime is paid, the cost would be 90 hours x $52 = $4,680

   Alternatively, switching engineers from their existing job:

   90 hours / 30 hours to produce a unit = 3 units valued at contribution per unit $1,495 = $4,485.

   The lower cost of the two options is $4,485 and this is the relevant cost.

5) The first rental period is part way through and the payment of $15,000 has already been made. Therefore, this is a sunk cost and not relevant. In order to obtain the machine for the required seven week period another 15 week standard rental agreement would have to be entered into, therefore the relevant cost is $15,250.

   If the machine was to be purchased, the relevant cost would be $20,000 (sales price less resale value). The lower relevant cost of the two options is to rent the machine for another rental period, $15,250.

6) The cost to produce the windows has already been incurred and is therefore sunk and not relevant.

   If DLW use the windows for the build and miss the conference the sales will not be lost. The chief executive will visit the clients at a later date to secure the sales; therefore there is no incremental loss in contribution. The chief executive's time is not relevant as he is paid an annual salary and would receive this irrespective of the visit to the clients.

   However, should the windows be used for the build, DLW would not be able to attend the conference and be liable to pay the non-attendance fee of $1,500.

   Total relevant cost $1,500

7) 400kg of other materials are required for the house build. The incremental cost is $6,000.

8) Fixed costs are not relevant as they will be incurred irrespective of whether the contract is taken or not.

9) Profit mark-up is not relevant as DLW is producing a minimum price quotation to exactly cover the relevant cost.

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(b)

When quoting a minimum price for the contract, relevant costing principles are being used. Only relevant costs i.e. those that change as a direct result of the contract decision are included in the quoted cost.

The minimum price will result in DLW making neither a profit nor a loss. This is not a sustainable pricing policy in the longer term as it does not include a contribution to the fixed costs of the organisation.

Relevant costing does not include a profit margin. This is not suitable for DLW in the longer term as the company is planning to expand into different countries and investors will also require a return on their investment.

(c)

Market skimming would be a suitable pricing strategy to launch the houses in the new country. Market skimming charges a high price for the product initially where the product is unique and there are significant barriers to entry for competitors. The price is reduced as new competitors enter the market with a similar product. The strategy aims to maximise the profit from the product.

The high quality materials and unique energy saving technology used in the houses should command high prices from customers keen to have a house with this technology. The house that consumers are willing to pay a high price for, together with the barrier to competitors of the new energy saving technology, make DLW's product suited to the market skimming pricing strategy. This market skimming approach will allow DLW to recover the research and development costs incurred to develop the energy saving technology.

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Answer to Question Seven

Rationale

The question examines candidates' knowledge and understanding of transfer pricing together with financial and non-financial divisional performance measures.

The learning outcomes tested are:
Part (a) & (c) D3(b), *discuss the typical consequences of a divisional structure for performance measurement as divisions compete or trade with each other.*

Part (b) D2(c) *discuss alternative measures of performance for responsibility centres.*

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

Part (e) C3(b) *discuss the role of non-financial performance indicators.*

Suggested Approach

For parts (a) and (c), candidates needed to carefully read and understand the data provided and assemble the figures to show the profitability of two divisions, with Division C supplying to Division D.

Part (b): candidates needed to carefully read the information in the question and use the appropriate figures to calculate the required performance measures

Part (d): a target ROI of 25% was required. Candidates needed to use their knowledge of the ROI formula to substitute in known values to arrive at a required revenue figure. The value of the external sales could then be taken from this figure to leave the required value of the internal sales.

Part (e) required an explanation of TWO non-financial measures that could also be used to monitor the performance of the manager of Division D against the objectives of CD company. A number of non-financial measures could have been suggested, but candidates needed to read the requirement carefully and explain the relevance of their chosen measure to the objectives of CD company.

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(a)

		C	D	Working
		$	$	
Sales				
	Internal	2,400,000		1
	External	2,600,000	10,000,000	2
		5,000,000	10,000,000	
Variable costs				
Cans				
	Internal		2,400,000	3
	External	1,600,000		4
Other variable		0	3,000,000	5
Fixed costs		2,400,000	1,750,000	
Profit		1,000,000	2,850,000	

Workings

1) Transfer price: $0.04 + ($2,400,000 / $40,000,000) = $0.10 * 1.2 = $0.12
Internal transfers 20,000,000 cans at $0.12

2) External sales by division C 20,000,000 cans at $0.13
External sales by division D 20,000,000 canned drinks at $0.50

3) As per Division C internal sales revenue

4) Division C variable cost 40,000,000 cans at $0.04

5) Division D variable cost 20,000,000 canned drinks at $0.15

(b)

	C	D
ROI	$1,000,000/$4,000,000 = 25%	$2,850,000/$12,650,000 = 23%
RI	$1,000,000 – ($4,000,000 x 7%) = $720,000	$2,850,000 – ($12,650,000 x 7%) = $1,964,500

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(c)

		C	D	Working
		$	$	
Sales				
	Internal	1,520,000		1
	External	3,900,000	10,000,000	2
		5,420,000	10,000,000	
Variable costs				
Cans				
	Internal		1,520,000	3
	External	2,000,000		4
Other variable		0	3,000,000	5
Fixed costs		2,400,000	1,750,000	
Profit		1,020,000	3,730,000	

Workings

1)	8,000,000 cans at $0.13 opportunity cost
	12,000,000 cans at $0.04 variable cost
2)	30,000,000 cans at $0.13
	20,000,000 canned drinks at $0.50
3)	As per Division C internal sales revenue
4)	50,000,000 cans at $0.04
5)	20,000,000 canned drinks at $0.15

(d)

ROI = profit / net assets.

Target ROI required is 25%.

25% = profit / 4,500,000, rearranging the formula gives profit = $1,125,000

Profit = Contribution – fixed costs, here fixed costs = $2,400,000. Therefore:

Contribution = $1,125,000 + $2,400,000 = $3,525,000

Contribution = revenue – variable cost. Here variable cost = $2,000,000. Therefore:

Revenue = $5,525,000

Revenue = Internal sales + external sales. External sales = 30,000,000 * $0.13. Therefore:

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Internal sales required = $1,625,000

20,000,000 internal sales. Transfer price should be set at a minimum of $0.08

Alternative solution
Profit requirement: 25% * (4,000,000 + 500,000) = $1,125,000

Therefore, additional $1,125,000 – $1,020,000 = $105,000 profit required

Total transfer price: $1,520,000 + $105,000 = $1,625,000

20,000,000 internal sales. Transfer price should be set at a minimum of $0.08

(e)

Brand awareness percentage. One of CD's stated objectives is to grow its business internationally. A measure of CD's presence in the other countries is brand awareness by consumers. A high brand awareness by consumers could be a lead indicator of increasing sales revenues.

Taste test results from comparison with main competitors. CD aims to grow its brand based on the distinctive taste of its product. A key indicator of potential future success is the measure of consumer preference.

A sample of consumers could be offered the CD soft drink along with that of a competitor. The proportion of sampled consumers selecting the CD soft drink in the taste tests could then measure consumer preference. If consumers favour the taste of the CD drink over competitors, potentially sales revenue will increase as consumers make CD's product their soft drink of choice.

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