Management Level Paper

P2 – Performance Management
May 2014 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 August at www.cimaglobal.com/P2PEGS

SECTION A

Answer to Question One

Rationale

The question examines candidates' knowledge, understanding and application of variance analysis as well as their understanding of responsibility accounting.
The learning outcomes tested are:
Part (a) C2(c), *evaluate performance using fixed and flexible budget reports.*
Part (b) C1(c), *identify controllable and uncontrollable costs in the context of responsibility accounting and why uncontrollable costs may or may not be allocated to responsibility centres.*

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 relevant variances in order to reconcile the actual and budgeted profit, being aware of the requirement for planning and operational variance calculations.
In part (b) candidates were required to apply their knowledge of responsibility accounting to provide advantages and disadvantages of the use of their statement to support responsibility accounting.

(a)

Statement to reconcile budget profit to actual profit for April

	$000	
Budget profit	1,730.00	
Sales volume contribution planning variance	(173.75)	Adverse
Sales volume contribution operational variance	(312.75)	Adverse
Sales price variance	(132.00)	Adverse
Variable costs variance	(99.00)	Adverse
Fixed costs variance	(50.00)	Adverse
Actual profit	962.50	

Budget market share: 2,000,000 / 40,000,000 = 5%

Revised budget market share: 5% x 37.5m = 1,875,000

Budget contribution per unit: $3.50 - $2.11 = $1.39

Sales volume contribution planning variance*: (2,000,000 - 1,875,000) x $1.39 = $173,750

Sales volume contribution operational variance**: (1,875,000 - 1,650,000) x $1.39 = $312,750

Sales price variance: ($3.42 - $3.50) x 1,650,000 = ($132,000)

Variable cost variance: (1,650,000 x $2.11) - $3,580,500 = ($99,000)

* Market size variance
** Market share variance

(b)

The revised statement provides additional detail on the causes of the sales volume variance, splitting into planning and operational elements. This additional detail will facilitate responsibility accounting by providing the company with the information to assess which elements of variances were under the control of company managers and which were not. The adverse sales volume contribution planning variance was caused by the change in the market and the manager should not be held accountable for this under responsibility accounting. However, the sales volume contribution operational variance could be said to be under the control of the manager and they should be held accountable.

The revised statement provides more limited information on the variable cost and fixed cost variances. The statement is predicated on the assumption that variable costs will change proportionately with a change in production volume. This may not be the case, for example, reduced production volumes could result in the company losing volume discounts from suppliers. This level of information is not available in the revised statement and would not facilitate responsibility accounting in this respect.

Answer to Question Two

Rationale	

The question examines candidates' knowledge and understanding of the learning curve.
The learning outcomes tested are:
Part (a) B1(e), *apply learning curves to estimate time and cost for new products and services.*
Part (b) B1(i), *discuss the concept of life cycle costing and how life cycle costs interact with marketing strategies at each stage of the life cycle.*

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 128th car before going to calculate the time for all 250 cars. Candidates then needed to use this information to assess the premium already included in the hourly rate before making the appropriate adjustment using the table in the scenario.

In part (b) candidates were required to discuss life-cycle costing using the specific circumstances given in the scenario to illustrate their discussion. A discussion, relating the Model Q car production at SVC to the requirement, was needed to score the highest marks.

(a)

$y = ax^b$	y =	9.078	
a = 13 hours	Average time to produce first 128 cars		
x = 128			
b = -0.074	Total time to first produce 128 cars	1,161.984 hours	

$y = ax^b$	y =	9.084	
a = 13 hours	Average time to produce first 127 cars		
x = 127			
b = -0.074	Total time to produce first 127 cars	1,153.668 hours	

Time to produce 128th car	8.316	hours

If all cars take 13 hours each to produce, total time required is 3,250 hours

Therefore, a premium of 20% is included in the stated hourly rate

Basic hourly rate = $60 per hour / 1.2 = $50 per hour

Time required to produce 250 cars

Time for first 128 = 1,161.984 hours

Time for remaining 122 cars: 122 x 8.316 hours = 1,014.552 hours

Total time = 2,176.536 hours

Therefore, a premium of 30% will added to the basic hourly rate

$50 x 1.3 = $65

Total labour cost of 250 cars = $65 x 2,176.536 hours = $141,475

(b)

Life-cycle costing is the accumulation of costs for activities that occur over the entire life cycle of a product, from inception to abandonment.

It is common that 80-90% of a product's costs are committed in the design and development stages of its life. The design and development costs for the prototype Model Q car are significant at $7.8 million. It is important for SVC to understand the total life cycle cost for the car in order to facilitate profit planning if and when production is started on a car for the wider market. An understanding of the life cycle cost will assist SVC in focussing attention on where the majority of costs are incurred. Designing out costs in design and development stages is likely to yield significant cost saving if and when full production of the car begins. Information on the life cycle cost for Model Q will also inform SVC on the required life cycle for the car in order to achieve a required profit and emphasise the need for the time to market to be minimised.

Answer to Question Three

Rationale
The question examines candidates' knowledge and understanding of cost of quality reports. The learning outcome tested is B1(d), *prepare cost of quality reports.*

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 quality cost impact of the various issues detailed in the scenario and then prepare a cost of quality report allocating the calculated costs under the appropriate headings. In part (b) candidates were required to discuss the relationship between conformance costs and non-conformance costs. Again, to score high marks, candidates needed to use the cost relationships exhibited at NJ to support their discussion points.

(a)

Cost of Quality Report for the latest year

	Volume	Rate $	Cost $
Prevention costs			
Staff training			780,000
Appraisal costs			
Inspection costs			2,300,000
Internal failure costs			
Re-worked bicycles	3,000	1,000	3,000,000
External failure costs			
Replacement bicycles	1,500	1,035	1,552,500
Sub total			**7,632,500**
Opportunity costs	12,500*	330	4,125,000
Total quality costs			**11,757,500**

* 2,500,000 x 0.5% = 12,500

(b)

NJ incurs conformance costs with the aim of removing defects and failure in production. Conformance costs comprise: i) prevention costs (the cost of ensuring products are not produced that do not conform with quality requirements) and ii) appraisal costs (the cost of assessing if products meet the required quality standard). Non-conformance costs are incurred as a result of faulty products being produced. Non-conformance costs comprise: i) internal failure costs (the cost incurred when sub standard products are produced but not delivered to the customer) and ii) external failure costs (the costs incurred when a sub standard product reaches the customer).

An increase in spend on conformance costs is likely to reduce the amount of cost incurred on non-conformance costs. The view is that the optimal amount to spend on conformance costs is where total quality costs are at a minimum. However, this is contrary to the TQM philosophy where the aim is zero defect production.

Staff training costs are prevention costs and a reduction in spend is likely to result in increased non-conformance costs that may lead to a rise in total quality cost. This could ultimately damage NJ's reputation and adversely impact revenues.

Answer to Question Four

Rationale

The 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 a suitable performance measure was required for each of the three non-financial perspectives.

Customer perspective
Objective: increase customer loyalty.
Performance measure: percentage of customers using loyalty card offers.
Customer loyalty is important to AST in terms of deepening the relationship AST has with its customers to drive revenues. A high percentage would indicate that AST has returning customers and that the offers they are targeting them with are of value to them. If AST can provide customers with the products that they value, customers will return and potentially purchase additional items from stores. Deepening the customer relationship to drive revenue may be cheaper than acquiring new customers.

Internal business process perspective
Objective: for customers to pay for goods in a reasonable time.
Performance measure: time spent by customers queuing to pay for products at a check out.
The customer experience at their supermarkets is extremely important to AST. A key indicator of the experience of a customer is the time queuing to pay for products at a check out. AST could measure average queue time to focus resources on managing queuing time to acceptable levels.

Learning and growth perspective
Objective: to have qualified staff able to meet the needs of the customer.
Performance measure: number of staff training days.
The number of staff training days is an indicator of staff having the required skills to serve customers and that they are continuing to develop professionally.

Answer to Question Five

Rationale

The question examines candidates' knowledge, understanding and application of linear programming and of the outputs of a linear programming model.
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 how linear programming methods can be employed for profit maximising, revenue maximising and satisfying objectives.*

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 identify the relevant constraints to be used in a linear programming model and then produce, using simultaneous equations, the optimum production plan and associated profit.

In part (b) candidates were required to explain the meaning of the given shadow price figure. The explanation required a description of the shadow price along with the relevance of the figure for material A at PTP.

(a)

(i)

Let E = the number of units of Product E produced and sold in June.
Let M = the number of units of Product M produced and sold in June.
<u>Constraints:</u>
Material A: $5E + 2M \leq 4{,}800$
Material B: $2E + 3M \leq 3{,}900$
Labour: $2E + M \leq 2{,}500$
Machine hours: $2E + 4M \leq 5{,}000$
Non-negativity: $E, M \geq 0$

Objective function: To maximise $51E + 38M$

(ii)

5E + 2M = 4,800   Equation (1)
2E + 3M = 3,900   Equation (2)
Equation (1) x 2 = Equation (3)
Equation (2) x 5 = Equation (4)
10E + 15M = 19,500   Equation (4)
<u>10E + 4M = 9,600</u>   Equation (3)
     11M = 9,900   Equation (4) – Equation (3)
M = 900
Substitute into Equation (1)
E = 600
Substitute values into the objective function:
Contribution: (51 x 600) + (38 x 900) = $64,800
Less fixed costs $50,000
Profit = $14,800

(b)

If one more kg of material A were available at the normal cost of $12, this would generate an additional $7 of contribution for PTP. Therefore, the shadow price of $7 for material A represents the maximum premium PTP should pay to acquire one more kg of material A.

SECTION B

Answer to Question Six

Rationale

The question examines candidates' knowledge, understanding and application of pricing strategies and their consequences.
The learning outcomes tested are:
Part (a) A3(a), *apply an approach to pricing based on profit maximisation in imperfect markets.*
Part (b), (c) and (d) A3(b), *discuss the financial consequences of alternative pricing strategies.*

Suggested Approach

Candidates needed to carefully read the question and use the information to relate their answers to the scenario. In part (a) candidates were required to apply their knowledge of the profit maximisation model in order to calculate a contribution figure.
In part (b) candidates needed to apply the cost-plus pricing technique. Candidates also needed to pay particular attention to the timing of revenue streams from customers and the customer age profile in order to calculate a total profit figure. In part (c) candidates needed to understand the customer age profile's impact on profit in order to calculate the required percentage of customers purchasing the magazine for a second consecutive month.

In part (d) candidates were required to discuss the market penetration and market skimming pricing strategies and their suitability to Y Magazine. It was necessary to apply the specific details about Y Magazine to the suitability discussion in order to gain high marks in this part of the question.

(a)

Variable cost

	$	Working
Paper	0.83	
Ink	1.20	1
Machine cost	0.22	
Other variable cost	0.15	
Total variable cost	2.40	

Workings
1   Ink cost per magazine without loses $1.08
     10% of ink wasted during printing
     $1.08 x (100/(100 – 10)) = $1.20

p = a -bx
p =   3.99
x =   60,000

Change in p		0.50
Change in x		10,000
b =		0.00005
a =		6.99

p = 6.99 - 0.00005x

MC = MR x = 45,900
p = $4.70

	$
Revenue ($4.70 x 45,900)	215,730
Variable cost ($2.40 x 45,900)	110,160
Contribution	105,570

(b)

Statement of total profit for the first three months

	Month 1	Month 2	Month 3	Total
	$	$	$	$
Sales revenue	234,000	257,400	291,330	782,730
Total cost	195,000	214,500	242,775	652,275
Profit	39,000	42,900	48,555	130,455

Workings

New customers	Number of Y Magazine sales		
	Month 1	Month 2	Month 3
50,000 month 1	50,000	45,000	38,250
10,000 month 2		10,000	9,000
15,000 month 3			15,000
	50,000	55,000	62,250

OAR $18,000,000 / 12,000,000 = $1.50 per magazine

Total cost per magazine $2.40 + $1.50 = $3.90

Sales price per magazine $3.90 x 1.2 = $4.68

(c)

Required profit	$100,000
Profit per copy of magazine ($4.68 - $3.90)	$0.78
Number of magazine copies required	128,205

X is the percentage of customers purchasing for a second month

Total required sales in the first three months

50,000 + 50,000X + 50,000X.0.85 + 10,000 + 10,000X + 15,000 = 128,205

102,500X = 53,205

X = 51.9%

(d)

A penetration pricing strategy is adopting by companies wishing to generate a large market share quickly by offering the product at a significantly cheaper price than competitors. The low initial price is designed to attract customers to the product. The price may be increased later in the product lifecycle when the customer's purchasing pattern has changed to favour the product in question.

Penetration pricing is suitable for products where there are similar substitute products available. This is the case in the home decoration print magazine market. The profitable BON Group may be able to support a short-term loss making financial position for the Y Magazine as it gains market share to a point where its size is a potential deterrent to other new entrants. Penetration pricing is suitable for products where the demand curve is elastic and there is a large market for the product. This may not be the case for the home decoration print magazine market as the existing titles may have built up customer loyalty as a result of their specific design features and journalistic style. The size of the market is not known and there may not be room for another profitable print title.

A market skimming pricing strategy sets a high price for the product initially to generate profit for the company quickly and reduces the price as competitors come into the market offering similar products. Highly innovative and unique products are likely to be able to take advantage of a market skimming strategy where consumers are willing to pay a premium for the product's unique design and/or technology. This may not be appropriate for Y Magazine if the magazine offers a very similar reader experience to the existing titles. A market skimming approach would require Y Magazine to have a relatively inelastic demand curve: the disposable nature of the magazine and the competitive market place do not appear to support the market skimming strategy.

Answer to Question Seven

Rationale

The question examines candidates' knowledge, understanding and application of alternative measures of performance for responsibility centres in the context of a chain of vehicle maintenance garages.
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'*;
Parts (b) and (c) D2(c), *discuss alternative measures of performance for responsibility centres.*
Part (d) B1(b), *evaluate the impacts of just-in-time production, the theory of constraints and total quality management on efficiency, inventory and cost.*

Suggested Approach

Candidates needed to carefully read the question and use the information to relate their answers to the scenario. In part (a) candidates were required to apply their knowledge of controllable and uncontrollable costs in order to provide an advantage and a disadvantage of charging an apportionment of head office costs to responsibility centres.
In parts (b) and (c) candidates needed to apply their knowledge of Return on Capital Employed (ROCE) and Residual Income (RI) metrics to perform calculations before providing an appraisal of the performance metrics. Candidates needed to be aware of the impact of the head office costs and calculate versions of ROCE and RI including and excluding these costs.
In part (d) candidates were required to discuss the suitability and the feasibility of benchmarking the performance of BLR against the performance of NKR. Candidates needed to cite the relevance of NKR as a private competitor company in their discussion.

(a)

An advantage of BLR garage managers being charged an apportionment of head office costs is that they become aware of the costs involved in supporting the work of their garage. Arguably, head office costs are largely support costs and are incurred in support of the operation of the garages. BLR garage managers should be aware of these support costs as this may lead to discussions about how the use of head office activities may be reduced.

Conversely, the BLR garage managers are being made accountable for an arbitrary apportionment of the head office costs over which they have no direct control. The arbitrary nature of the apportionment of costs by head office is out of the control of the garage management. This could potentially have a de-motivating effect on managers as their performance metrics do not represent a true picture of the performance of their garage that is under their control.

(b)

	Garage A		Garage B	
	This year	Last year	This year	Last year
ROCE (based on net profit)	14%		15%	
ROCE (based on controllable profit)	20%	14%	25%	16%
Controllable profit $000	315		100	

Last year the manager of Garage A would not receive a bonus as the ROCE was below the 15% target. The ROCE measure is useful here as it is a relative measure that allows comparison with other garages.

This year Garage A increased sales revenue by 8% and together with tight control of other operating costs, delivered an increase in controllable margin of 6 percentage points.

Garage A appeared to invest in net assets as the net book value of assets increased by $100,000. Despite this increase in net assets, Garage A increased ROCE based on controllable profit from 14% to 20% in this year. However, including the apportionment of head office fixed overhead costs, the ROCE in this year is maintained at 14%, a position that would not reward the manager with a bonus. ROCE does not encourage the purchase of new assets and can encourage dysfunctional decision making, providing managers with an incentive to keep aging (and possibly inefficient and obsolete) assets.

It appears that Garage A has improved its performance in this year, yet as a result of acquisition of new assets and the apportionment of head office fixed overhead cost, the manager will not receive a bonus based on target ROCE.

Last year Garage B generated a ROCE of 16%; a figure in excess of the target and thus the manager was awarded a bonus.

Sales performance in this yearappears to be strong, an increase of 10% over last year. However, the increase in sales has not been delivered efficiently with other operating costs increasing significantly resulting in a year on year fall in controllable profit margin of 1 percentage point.

Garage B does not appear to have invested in non-current assets, a potential reason why other operating costs have increased due to a decrease in machine efficiency and increased maintenance costs. This adverse impact on profit has been offset by the reduction in net book value of the non-current assets resulting in a favourable impact on ROCE (based on controllable profit). This measure of ROCE has increased from 16% last year to 25% this year. Including the apportionment of the head office fixed overhead cost, the ROCE is 15%, a position that would result in a bonus for the manager. The manager has clearly not performed well, yet will still receive a bonus this year. Given this analysis, ROCE does not appear to be a suitable basis to award bonuses to managers.

(c)

	Garage A		Garage B	
	$000	$000	$000	$000
	20X4	20X3	20X4	20X3
RI (based on net profit)	96		29.5	
Imputed interest charge	128		32	
RI (based on controllable profit)	187	90	68	47
Imputed interest charge	128	120	32	48

RI can reduce the problem that ROCE perpetuates, of discouraging investment in assets with ROCE in excess of the garage's target but lower than the garage's current ROCE. RI also highlights the cost of financing to garage managers.

However, as RI is an absolute measure it does not facilitate comparison between garages. The absolute nature of the performance metric does not relate the value of the assets employed by a garage to the profit generated.

(d)

Benchmarking is a continuous process of measuring an organisation's services and activities against those of the best performing organisation. The benchmarking exercise aims to compare performance with the best in class, identify areas of underperformance and take action to improve.

The measurement against a set standard at BLR will offer no incentive to improve on this and is contrary to the TQM ethos. Benchmarking against NKR, a successful competitor company, will be consistent with the TQM ethos of continuous improvement, provided NKR is the best.

As NKR is a private company, there may be little publically available information on its performance. BLR may also encounter problems in obtaining commercially sensitive performance data from NKR. NKR is unlikely to be willing to share data and information on its processes with BLR, a competitor company.