Management Level Paper

P2 – Performance Management
March 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 April 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 outcomes tested are:
B1(e) *apply learning curves to estimate time and cost for new products and services.*

B1(h) *explain how target costs can be derived from target prices and the relationship between target costs and standard costs.*

Suggested Approach

Candidates needed to carefully read the information in the question. Part (a) required candidates to calculate the time required to produce the 128th component.

In part (b) candidates were required to calculate target and expected costs for all 128 components, to be able to derive a cost gap.

Part (c) required candidates to adjust the calculated labour cost by the value of the cost gap to arrive at a target labour cost.

The average time per component as a proportion of the time for the first component needed to be derived. The seventh root of this percentage showed the rate of learning required.

(a)

Cumulative average time for first 128 components

$y = ax^b$	x = 128	y = 11.96 hours
a = 25 hours	b = -0.152	

Total time for first 128 components

11.96 hours * 128 = 1,530.88 hours

Cumulative average time for first 127 components

$y = ax^b$	x = 127	y = 11.97 hours
a = 25 hours	b = -0.152	

Total time for first 127 components

11.97 hours * 127 = 1,520.19 hours

Time for component 128 = 1,530.88 – 1,520.19 = 10.69 hours

(b)

	Average for 128 components	**Total 128 components**
	$	$
Sales price	530	
Required margin	20%	
Target cost	424	54,272
Labour 11.96 hours*$15	179.40	22,963.20
Other costs	265	33,920
Expected cost	444.40	56,883.20
Cost gap	20.40	2,611.20

(c)

Cost gap = $2,611.20

Target labour cost: $22,963.20 - $2,611.20 = $20,352

Target labour hours: $20,352 / $15 = 1,356.8

Target cumulative average time per component: 1,356.8 / 128 components = 10.6 hours

Target learning rate: 10.6 hours / 25 hours ^(1/7) = 88%

Answer to Question Two

Rationale
The question examines candidates' knowledge and understanding of Total Quality Management and Kaizen costing when set in a car 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 principles of Total Quality Management 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 changes required to PB's planning and control system. Candidates then needed to explain the specific changes required from the scenario and the Kaizen concepts that would be supported by the changes. Citing generic conditions without relevance to the situation described at PB would earn only limited marks.

(a)

Total Quality Management has two basic principles: 'get it right first time' and 'continuous improvement'.

Get it right first time essentially equates to aiming for a zero-defect target. This principle is based on the premise that prevention costs are less than the cost of correction.

The principle of continuous improvement is based on the idea that, although the ideal state may never be achieved, it is the aim. A target of zero defects may not be achievable. However, the principle of never being satisfied until this is achieved will engender the correct behaviour of continually seeking to improve.

(b)

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

As Kaizen costing is a system of cost reduction, PB would require different target information than at present. Rather than setting a budget based on standard costs, the target would be the Kaizen cost.

Cost analysis in Kaizen costing requires the comparison of target Kaizen costs to actual cost reductions. The performance reporting in PB would need to change from the current system of comparing actual costs to budget costs to accommodate this.

Kaizen costing sets and applies cost reduction targets monthly. The current system of setting targets (currently the annual budget at PB) once per year needs to change to accommodate more frequent target setting.

Answer to Question Three

Rationale

The question examines candidates' knowledge and understanding of flexible budgets and the use of non-financial performance indicators.

The learning outcomes tested are:
C2(c) *evaluate performance using fixed and flexible budget reports.*

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

Suggested Approach

Part (a) (i) required candidates to use the value of the sales volume contribution planning variance, the budget sales volume and standard contribution in order to calculate a revised budget sales volume. Substituting the values of the budget sales volume, standard contribution and the sales volume contribution planning variance into the variance formula and re-arranging the equation gave candidates the value of the revised budget sales volume. This figure needed to be used to revise the revenue and variable cost budgets.

Part (a) (ii) required candidates to use the value of the actual sales volume to produce a flexed budget.

Part (b) required an explanation of TWO non-financial measures that APZ could use to monitor the performance of the new fast-food restaurant. Candidates could have chosen a number of non-financial measures, but the information in the scenario needed to be used to explain the relevance of their chosen measure to the performance of the new fast-food restaurant.

(a) (i)

	Budget Standard	**Revised Budget**
Sales (number of meals)		5,200
	$	*$*
Sales revenue	7.50	39,000
Variable costs	4.40	22,880
Fixed costs		5,250
Profit		10,870

Standard contribution: $7.50 - $4.40 = $3.10 per meal

Sales volume contribution planning variance = $2,480 Adverse

Sales volume contribution planning variance = (Budget sales - revised budget sales) * standard contribution

(2,480) = (6,000 - x) * 3.10

Revised budget sales = 5,200 meals

Alternatively: $2,480 / $3.10 = 800. 6,000 – 800 = 5,200 revised budget sales

(ii)

	Budget Standard	Flexed Budget	Actual	Variance
Sales (number of meals)		5,400	5,400	0
	$	$	$	$
Sales revenue	7.50	40,500	40,365	(135)
Variable costs	4.40	23,760	24,632	(872)
Fixed costs		5,250	4,950	300
Profit		11,490	10,783	(707)

(b)

Speed of food delivery. Customers at fast food restaurants expect their food order to be served quickly. If APZ is to be successful, it must achieve fast food delivery. Therefore a measure of time from customer order to food service is a key metric to monitor in ascertaining the restaurant's success at this requirement.

Number of repeat customers. APZ operates in a small town that offers a number of other choices of fast food restaurant to its residents. If APZ is to establish itself and grow market share, the restaurant needs to develop a loyal customer base. Number of repeat customers is a measure that could indicate the sustainability of the business and future financial success.

Answer to Question Four

Rationale

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

The learning outcome tested is A3(a) *apply an approach to pricing based on profit maximisation in imperfect markets.*

Suggested Approach

Part (a) required candidates to use the relevant formulae to calculate the price at which profit would be maximised. Candidates then needed to use this price along with the associated demand and variable costs per unit to calculate the contribution. Candidates needed to note the length of the introductory phase. To calculate the maximum cost of the advertising campaign, three months' contribution needed to be calculated and the required profit subtracted from this.

Part (b) required an explanation of two reasons why it may not be appropriate to set the introductory price of Product Z using the assumptions contained in the profit-maximisation model. Candidates needed to give specific reasons appropriate to the circumstances detailed in the scenario that may result in the assumptions used not being relevant.

(a)

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

P = a – bx

b = 32.5 / 2,500 = 0.013

200 = a - 0.013*20,000, therefore, a = 460

P = 460 – 0.013x

MR = a – 2bx, MR = 460 – 2*0.013x

Profit is maximised when MR = MC

MC = $85 + $56 + $20 = 161

161 = 460 – 2*0.013x, therefore x = 11,500.

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

460 – 0.013*11,500 = $310.50

Introductory phase three months 3*11,500 = 34,500 units

	Per unit $	3 months units	Introductory phase $
Revenue	310.50	34,500	10,712,250
Material	85	34,500	2,932,500
Labour	56	34,500	1,932,000
Variable overhead	20	34,500	690,000
			5,554,500
Contribution			5,157,750
Maximum advertising costs (balancing figure)			2,657,750
Three month profit target			2,500,000

(b)

The relationship between price and demand for product Z is an estimate. It is improbable that relationships between price and demand for previous products at SAF are going to be relevant for product Z. The new and innovative design of the Z is likely to mean that demand for the product will be highly inelastic and potentially differ from the relationship observed with previous products.

Price will not be the only factor affecting the demand for product Z. The significant advertising and marketing campaign together with the unique nature of the product are likely to attract consumers and impact demand. SAF must look to the external market to set a price for the launch and establish a pricing strategy for the life of product Z as competitors launch rival products.

Answer to Question Five

Rationale

The question examines candidates' knowledge and understanding of projected performance evaluation using ratio analysis and the impact of involving staff in financial target setting in a health club environment.

The learning outcomes tested are:
C2(a) *evaluate projected performance using ratio analysis.*

C3(a) *discuss the impact of budgetary control systems and setting of standard costs on human behaviour.*

Suggested Approach

Part (a) required candidates to read the scenario carefully and to understand the adjustments required to Quarter 3 data to project Quarter 4 figures. Candidates then needed to calculate the required ratios using Quarter 4 figures and finally give a conclusion stating whether the health club manager would be expected to receive a bonus.

Part (b) required a discussion of the potential impact for TES of involving the health club managers in the production of their quarterly financial targets. Advantages and disadvantages were required, referring to the specific circumstances in the scenario. The scenario stated 'the financial targets are based on a national view of all TES health clubs'. Candidates were required to use this information when explaining the impact of the manager's involvement.

(a)

	Q4	**Working**
	$000	
Revenue	41.58	1
Less:		
Staff costs	12.00	
Other costs	20.90	2
Profit	8.68	
Net assets	110	
Number of customers	630	
Profit margin	20.9%	
Quarterly ROCE	7.9%	
Asset turnover	37.8%	

Workings

1 Q3 average revenue per customer = $36,000 / 600 = $60
Increase of 10%: $60 * 1.1 = $66

Customer numbers: 600 * 1.05 = 630

Revenue = 630 * $66 = $41,580

2 Q3 other costs $22,000 * 0.95 = $20,900

Based on the forecast performance in quarter 4, only one of the three financial targets will be achieved. Therefore a bonus will not be awarded to the manager of health club E.

(b)

The managers' involvement with setting the quarterly financial target could mean that the target will be more accurate and realistic. This is because the managers will be close to the operations of the health clubs and will be able to use their specialist knowledge to advise on regional variations to targets. For example, a national assumption of an increase of 10% in average revenue per customer may not be appropriate for health club E and should not automatically be factored in to target setting. This involvement of managers could result in more accurate forecast information that can be used by the finance team in devising the financial targets.

However, it is possible that the input of the managers may result in unrealistic financial targets. The managers may attempt to influence the targets in order to attain a bonus more easily. The health club managers may also not have an overall picture of the health club market or TES's strategic outlook.

SECTION B

Answer to Question Six

Rationale
The question examines candidates' knowledge and understanding of a limiting factor situation to maximise company profit along with aspects of breakeven and margin of safety analysis.

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

Suggested Approach
Part (a)
Candidates needed to read the question carefully to understand what was required and produce calculations to establish the limiting factor. A calculation of the contribution per unit of limiting factor for each product was needed in order rank the products and then a production plan produced, incorporating the additional order from the main customer. Based on this production plan the resultant profit could be calculated.

Part (b)
Candidates needed to relate their explanation to the scenario and give answers that were specific to GF and the market it was operating in.

Part (c)
A suggested approach was for candidates to calculate a weighted average C/S ratio to enable a calculation of the breakeven revenue. The margin of safety calculation required the use of the calculated breakeven revenue. Finally, limitations of breakeven analysis in this specific scenario needed to be explained by candidates.

(a)

	S	T	B	Total	Available
Material m^2 per unit	5	0.5	1.5		
Labour hours per unit	3	1	2.25		
Demand - budget and order (units)	3,000	7,000	5,000		
Material m^2 required	15,000	3,500	7,500	26,000	14,500
Labour hours required	9,000	7,000	11,250	27,250	30,000

Production is constrained by material availability

	S	T	B
	$	$	$
Selling price	250	40	100
Direct materials ($X per m^2)	100	10	30
Direct labour ($X per hour)	36	12	27
Variable overhead ($3 per machine hour)	9	3	6.75
Contribution per unit	105	15	36.25
Material m^2 per unit	5	0.5	1.5
Contribution per material m^2	21	30	24.17
Rank	3rd	1st	2nd

After new customer order (7,000 m^2 of material required) 7,500 m^2 of material are available

	S	T	B	Total
New customer order (units)	1,000	1,000	1,000	
Material required m^2	5,000	500	1,500	7,000
Production (units)	0	6,000	3,000	
Material required m^2	0	3,000	4,500	7,500
Production plan (units)	1,000	7,000	4,000	
	$	$	$	$
Sales revenue	250,000	280,000	400,000	930,000
Direct material	100,000	70,000	120,000	290,000
Direct labour	36,000	84,000	108,000	228,000
Variable overhead	9,000	21,000	27,000	57,000
Contribution	105,000	105,000	145,000	355,000
Fixed cost				300,000
Profit				55,000

(b)

The optimal production plan is based on demand assumptions that were budgeted at the start of the year. This may not consider the latest external demand as a result of the feature in the fashion magazine. This is not considered in the budget as it was prepared at the start of the year before the fashion magazine feature was published.

The optimal production plan is based on the most effective use of resources at GF and not on the requirements of its customers. Optimal profit based on the constraints GF is under is generated by producing 1,000 units of S, 7,000 units of T and 4,000 units of B (including the order from the new customer). This does not consider a potential change in the market.

Based on the budget constructed at the start of the year, demand for 12,000 units of clothing was anticipated requiring 19,000m^2 of material. The order from the new customer has now increased this figure to 26,000m^2. The availability of material, now in March, is limited to 14,500m^2. The reduced availability of material may also affect the price per m^2, the assumptions on material price should also be updated.

Note, only two issues are required.

(c) (i)

The breakeven point is achieved when GF make neither a profit nor a loss. At the breakeven point the contribution generated by the sales will exactly match the value of the fixed costs. Based on the product mix for April, GF will break even at a revenue of $750,000.

	S	**T**	**B**
	$	*$*	*$*
Production (units)	4,000	5,000	4,000
Revenue	1,000,000	200,000	400,000
Contribution	420,000	75,000	145,000
Total contribution			640,000
Total revenue			1,600,000
Weighted average C/S ratio			40%
Fixed costs			300,000
Breakeven revenue			750,000

(ii)

The margin of safety is the difference between the sales revenue for the production plan and the sales revenue at the breakeven point. The margin of safety is 53%.

$$\text{Margin of safety} = \frac{\text{Sales revenue - breakeven revenue}}{\text{Sales revenue}}$$

$$= \frac{1{,}600{,}000 - 750{,}000}{1{,}600{,}000}$$

$$= 53\%$$

(iii)

1) The analysis assumes that the products will be sold in the stated mix. This may not be the case for GF as the fashion market can change quickly and consumer demands cannot be predicted exactly. Changes in relative demand for the different products are not accommodated in the breakeven analysis.

2) Breakeven analysis assumes that costs and revenues display a linear relationship over the production range in question. This may not be the case for a number of reasons. For example, unit production time may be impacted by the learning curve effect. This assumption provides an overly simplified view of the cost and revenue relationships and impacts the accuracy of the resulting calculation.

3) Fixed costs are assumed to be constant over the entire production range in question. For example, an increase in fixed costs due to production facility expansion is not considered in the analysis. The breakeven revenue is what is required to generate contribution equivalent to a given fixed cost only.

Answer to Question Seven

Rationale

The question examines candidates' knowledge and understanding of transfer pricing together with the implications of outsourcing.

The learning outcomes tested are:

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

Part (c) B1(j), *discuss the concept of the value chain and the management of contribution/profit generated throughout the chain.*

Suggested Approach

For part (a), carefully read and understand the data provided and assemble the figures to show the profitability of two divisions, with Division S supplying to a Division B.

Part (b) (i) carefully read the information in the question and use the appropriate figures in calculating the profit for each division and the total SBA company.

Part (b) (ii) a target profit of $450,000 was required. Candidates should firstly adjust this figure for the contribution from the existing external demand. Divide the resulting figure by the 25,000 components to give a required contribution per unit. The contribution per unit should then be added to the variable cost per unit.

Part (c) required a discussion of potential implications for SBA of outsourcing the production of one type of component that it manufactures; candidates were required to explain potential positive and negative implications for SBA.

(a)

	S	B	Working
	$	**$**	
Sales			
Internal	3,850,000		1
External	4,750,000	7,200,000	2
	8,600,000	7,200,000	
Variable costs			
Components			
Internal	0	3,850,000	3
External	7,700,000		4
		[MMU1]	
Other variable	0	1,888,000	5
Fixed costs	560,000	1,460,000	
Profit	340,000	2,000	

Workings

1) 55,000 components at $50 opportunity cost
   25,000 components at $44 marginal cost

2) 95,000 components at $50
   16,000 units at $450

3) As per division S internal sales revenue

4) 175,000 components at $44

5) 16,000 units at $118

(b) (i)

	S	B	SBA	Working
	$	**$**	**$**	
Sales				
Internal	0	0	0	
External	7,500,000	7,200,000	14,700,000	1
	7,500,000	7,200,000	14,700,000	
Variable costs				
Components				
Internal	0	0	0	
External	6,600,000	3,360,000	9,960,000	2
	[MMU2]			
Other variable	0	1,888,000	1,888,000	3
Fixed costs	560,000	1,460,000	2,020,000	
Profit	340,000	492,000	832,000	

Workings

1) 150,000 components at $50 market price
   16,000 units at $450

2) 150,000 components at $44
   80,000 components at $42

3) 16,000 units at $118

(b) (ii)

Profit requirement $	450,000	
Remaining production capacity	25,000	=175,000 - 150,000
Additional contribution required $	110,000	=450,000 - 340,000
Contribution per component $	4.40	=110,000/25,000
Variable cost $	44	
Sell externally per component $	48.40	= 44 + 4.40

(c)

Many organisations have taken the decision to outsource the manufacture of their components rather than produce internally. The primary driver for these decisions is financial competitiveness. Lower cost, and in some cases lower taxation rate economies, may offer cheaper production and allow the organisation to focus on its core activities.

An external supplier may be able to offer SBA the same component at a lower cost than it is currently incurring internally. SBA would be able to make direct cost savings together with possible fixed production cost savings.

The external supplier could also potentially provide a higher degree of flexibility than the internal manufacturing division. Specialist component manufacturers may utilise the latest technology in production without SBA bearing the investment risk but benefiting from the more efficient manufacturing methods.

When selecting an external company to produce components, SBA must consider the choice of supplier carefully to ensure the product is in line with its requirements.

A potential loss of control is another consideration, as the two organisations will have differing priorities and objectives. A close relationship is required between the two organisations so that there is knowledge of lead times and the demand cycle at SBA.

Outsourcing the manufacture of components will result in spare capacity at SBA. Can this be utilised or can cost savings be achieved through redundancy and decommissioning?