

Performance Pillar

P2 – Performance Management

Examiner's Answers

SECTION A

Answer to Question One

(a)

The average time for 64 batches (i.e. 6,400 units) is:

$$Y = ax^b = 1500 \times 64^{-0.2345} = 565.64 \text{ hours}$$

(b)

The total time for 64 batches is 64×565.64 hours, which is a total of 36,200.96 hours

The average time for 63 batches is:

$$Y = ax^b = 1,500 \times 63^{-0.2345} = 567.735 \text{ hours, which is a total of } 35,767.31 \text{ hours}$$

Thus the time for the 64th and subsequent batches is 433.65 hours

(c)

Revenue from 9,000 units (9,000 units @ \$124)		\$ 1,116,000
Costs of 10,000 units:		
Variable costs:		
Non-labour (10,000 units @ \$38)	380,000	
Direct labour(see below)	<u>621,748</u>	
	1,001,748	
Fixed costs	<u>80,000</u>	<u>1,081,748</u>
Profit target		<u>34,252</u> <u>100,000</u>
Revenue required from final 1,000 units		65,748

Direct labour cost:

Total time = 36,200.96 hours + (36 batches x 433.65 hours) = 51,812.36 hours

The direct labour rate is \$12 per hour so this gives a cost of \$621,748.32

The 1,000 units being sold in the decline stage need to be sold at an average selling price of \$65.75 ($\$65,748 / 1000$) in order to meet the profit target of \$100,000.

Answer to Question Two

(a)

Kaizen Costing is a system of cost reduction based upon the concept of continuous review of systems and procedures to identify and implement small incremental cost savings. It is used in the production phase of a product and employees are both encouraged and empowered to recommend changes that they believe will reduce costs without affecting the quality of the products or otherwise adversely affecting the customer's perception of the products.

(b)

Standard costing and variance analysis is used as a means of monitoring performance by comparing actual costs with the standard costs that have been set. SF currently sets its standards at the start of the financial year and then uses these standards as the basis of its comparisons. This implies that these standards are the targets to be achieved for the year.

This system does not allow for improvements during the year. Kaizen Costing is based on continuous improvements being made throughout the year. Consequently the Kaizen cost is a moving target that changes each month.

This is in conflict with the concept of having a clear and fixed target against which performance is to be measured. If a changing standard were to be set based on the revised Kaizen Cost and used as the basis of performance management this may confuse managers and would also affect the measurement of variance trends over time.

Answer to Question Three

Value Analysis is a systematic interdisciplinary examination of the factors which affect the cost of a product in order to determine the means of achieving the specified purpose in the most economical manner while meeting the required level of quality and reliability.

Functional Cost Analysis is a method that can be applied to examine the component costs of a product or service in relation to the value as perceived by the customer. Functional Cost Analysis can be applied to new products and breaks the product down into its component parts. For example a garden table may have the function to fold completely flat and therefore require much less storage space. The outcome of the analysis is to improve the value of the product while maintaining costs and or reduce the costs of the product without reducing value.

Value Analysis may therefore be viewed as a cost reduction and problem solving technique that analyses an existing product in order to identify and reduce or eliminate any costs which do not contribute to value or performance.

In contrast, Functional Cost Analysis focuses on the value to the customer of each function of the product and consequently allocates resources to those functions from which the customer gains the most value.

It is clear from the scenario that LCG needs to be able to reduce its selling prices in order to compete in the market. This selling price reduction can only be sustained by a reduction in LCG's unit costs; however such a reduction must not be achieved by compromising on quality.

Both value analysis and functional cost analysis have potential to help LCG but value analysis is likely to be a more useful technique because garden tables and chairs are products that are sold more on the basis of their use value rather than their esteem value.

Answer to Question Four

Feedforward control systems are the comparison of draft plans with the objectives of the company.

In the scenario provided the consultancy company has a number of objectives, two of which are related to their cash flow. The first of these is to reduce the overdraft to zero by 30 June 2012 and the second is to have a positive cash balance of \$145,000 by 31 December 2012.

An initial draft of the cash budget will be produced based on the expected sales, costs, and other functional budgets of the company. It is usual for cash budgets to be prepared showing the cash inflows and outflows for each month so that the consultancy firm can identify its expected monthly cash balance. This can then be compared with the company's objectives to see if their cash balance objectives are being achieved. It is this comparison that is the process of feedforward control. It may be that if the objectives are not achieved by the first draft of the budget then the plans may need to be revised by delaying an investment or perhaps by changing the levels of receivables and payables.

Feedback control systems are the comparison of actual results against the budget that has been approved. Thus in the context of the consultancy firm a comparison of the actual monthly cash balance can be made against the budgeted cash balance for that month.

As with any budget and actual comparison there may be an adverse or favourable variance. If this is significant then further analysis may be required to determine its cause. It may be that an investment cost more than was expected, or receivables took less time to pay than expected, or payables were paid later than expected. This comparison process is feedback control.

Thus initially the difference between feedforward and feedback control systems is that feedforward occurs in the budget setting stage whereas feedback control occurs during the year. This means that feedforward identifies potential problems before they occur (and may enable them to be prevented) whereas feedback identifies problems after they have happened.

Answer to Question Five

(a)

The main principle of the Balanced Scorecard is that an organisation's performance should not be measured on the basis of its financial results alone. Other key performance indicators are relevant to an organisation's success.

The balanced scorecard typically identifies four groups (or perspectives) of performance indicator that would be suitable for most organisations, though each organisation is free to determine the performance indicators that are most relevant to its own needs. The typical perspectives are: customer perspective; internal business perspective; innovation and learning perspective; and financial perspective.

Many people believe that success in the non-financial performance measures will lead to success in the financial performance measures so that these other measures are leading measures whereas the financial measures are lagging measures.

The airline company could use the balanced scorecard to monitor its performance in other areas of its business. It is important for service businesses such as airlines to understand the needs of its customers and thus measures connected with the customer perspective are important. The airline may discover that particular destinations and flight times are demanded by their customers and this may lead the airline company to develop new routes which can be measured using the innovation and learning perspective.

The airline can also look at how it operates its processes both in relation to its staff and its customers. These could be used to improve the financial results because costs savings can be made.

(b)

The airline could measure the number of new destinations that it has provided to its customers during the year. This measure relates to the innovation and learning perspective. The greater the number of destinations, the more choice it has provided to its customers and thus increased its potential customer base.

The airline company could measure the amount of time it takes for its staff to prepare the aircraft between flights, thus measuring the turnaround time. This is monitoring its internal business processes. The longer it takes to prepare the aircraft, the more expensive it is for the airline company because its asset is not earning revenue at that time.

SECTION B

Answer to Question Six

(a)

	<i>Note</i>	\$
Production director – meeting	1	NIL
Material A	2	1,375
Material B	3	360
Components	4	3,000
Direct labour	5	2,100
Machine hours	6	175
Fixed overhead	7	NIL
Total relevant cost		7,010

Notes:

1. The production director has already had this meeting with the potential client, therefore the relevant cost is NIL firstly because it is a past cost, and secondly because even if it were future the director is paid an annual salary and therefore there is no incremental cost to RFT.
2. Material A is in regular use by RFT and consequently its relevant value is its replacement cost. The historical cost is not relevant because it is a past cost and the resale value is not relevant since RFT is not going to sell it since the material is in regular use and therefore must be replaced.
3. Material B is to be purchased for the contract therefore its purchase cost is relevant. Although only 30 litres are required for the work the minimum order quantity is 40 litres and as RFT has no other use for this material and there is no indication that the unused 10 litres can be sold, the full cost of purchasing the 40 litres is the relevant cost.
4. The components are to be purchased from HY at a cost of \$50 each. This is a relevant cost because it is future expenditure that will be incurred as a result of the work being undertaken.
5. Since 75 hours of spare capacity are available which have a zero relevant cost, the relevant cost relates only to the other 160 hours. RFT has two choices: either use its existing employees and pay them overtime at \$14 per hour which is a total cost of \$2,240; or engage the temporary staff which incurs their cost of \$1,920 plus a supervision cost of \$180 which equals \$2,100. The relevant cost is the cheaper of these alternatives which is to use the temporary employees.
6. The machine is currently being leased and it has spare capacity so it will either stand idle or be used on this work. The lease cost will be incurred regardless so the only relevant cost is the incremental running cost of \$7 per hour.
7. Fixed overhead costs are incurred whether the work goes ahead or not so it is not a relevant cost.

(b)

The factors that would be considered by HY to determine the opportunity cost of the component are its available capacity and the extent to which it has unsatisfied demand for its products.

If HY has spare capacity then if the components can be produced for RFT using the capacity that is available there is no opportunity cost so the relevant cost to the group would be the same as the relevant cost to HY, i.e. the variable cost.

If HY does not have sufficient spare capacity to produce all of the components demanded by RFT then to the extent that the internal sales are utilising capacity that would have been used to produce more units for external customers there is an opportunity cost to the group equal to the contribution forgone by not making those external sales.

Once there is no further unsatisfied external demand then the opportunity cost reverts to NIL because there is no loss of contribution.

(c)

- (i) When a cost based transfer pricing policy is used it is usual for it to be on a cost plus basis so that the "plus" provides an incentive to the supplier to make the internal sale. If it is on a cost only basis then there is no profit to the supplier, nor is there any incentive for them to be efficient because the cost (and therefore the inefficiency) is simply passed on to the buyer. When a cost plus transfer price is used then the efficiency issue is made even worse as illustrated by the following example:

Assume that the transfer price is actual cost + 30%. If the cost to the supplier is \$10 then the transfer price would be \$13 ($\$10 + 30\%$) and thus the supplier would record a profit of \$3 from the internal sale.

However, if the supplier were to become inefficient so that the cost of the item increased to \$12, then the new transfer price would be \$15.60 ($\$12 + 30\%$) with the result that the new supplier profit would be \$3.60.

This means that the supplier profit increases as a result of the supplier's inefficiency, and therefore the transfer pricing policy encourages such inefficiency to occur.

- (ii) If standard costs are used instead of actual costs then the problem is solved provided the standard that is used is fair to both the supplier and the buyer.

Firstly it is important that both the supplier and buyer agree the standard cost for the item as being a fair standard. This may be difficult to achieve without the intervention of head office as it may be affected by the negotiating skills of the managers of the respective responsibility centres.

Secondly, there is the need to review the standard in the light of changing conditions that are beyond the control of the supplier. It would not be fair for the transfer price to be based on an out of date standard if the reason it has become out of date is outside the control of the supplier. This would require a renegotiation of the standard.

Using the above example and assuming that the standard cost of the item is \$10. This would mean that initially the supplier was achieving the standard cost and there would be no change to the transfer price. However if the supplier was to become inefficient the transfer price would remain at \$13 and so the supplier's profit reduces to \$1. Conversely, if the supplier were to become more efficient and produce the item for \$9 then their profit would increase to \$4.

This would seem to solve the problem identified in (i) above as it encourages the supplier to be efficient.

Answer to Question Seven

(a)

(i)

Year Division	2011		2010	
	Northern \$m	Southern \$m	Northern \$m	Southern \$m
Cash flow	42.000	60.000	37.000	55.000
Depreciation (W1)	<u>8.750</u>	<u>16.250</u>	<u>8.050</u>	<u>14.950</u>
Profit	33.250	43.750	28.950	40.050
Average capital employed	122.500	227.500	115.500	214.500
Return on capital employed (ROCE) %	27.14	19.23	25.06	18.67

Workings

(W1) Depreciation

Year Division	2011		2010	
	Northern \$m	Southern \$m	Northern \$m	Southern \$m
NBV @ start of year	72.45	134.55	70.00	130.00
Add: Additions	15.05	27.95	10.50	19.50
Subtotal	87.50	162.50	80.50	149.50
Depreciation @ 10%	<u>8.75</u>	<u>16.25</u>	<u>8.05</u>	<u>14.95</u>
NBV @ end of year	78.75	146.25	72.45	134.55

(ii)

Year Division	2011		2010	
	Northern \$m	Southern \$m	Northern \$m	Southern \$m
Turnover	168.00	240.00	148.00	220.00
Capital employed	122.50	227.50	115.50	214.50
Profit	33.25	43.75	28.95	40.05
Asset Turnover	1.37	1.05	1.28	1.03
Profit / Sales %	19.79	18.23	19.56	18.20

The Southern division has not been able to achieve a ROCE of 20% in either year and therefore their manager would not receive a bonus payment in respect of either 2010 or 2011, whereas the Northern division has achieved this target return in both years.

The manager of the Southern division might well argue that the division's non-current asset values are higher since the assets were more recently acquired than those of the Northern division. Hence the capital employed of the Southern division is much higher than that of the Northern division and consequently the ROCE of the Southern division might inevitably be lower and therefore having the same percentage target as the Northern division is unfair.

However, while this may be true, it is not the only factor that may have caused the difference between the divisions' performances. It can be seen from the secondary ratio calculations that both divisions have improved their asset turnover and profit to sales % between 2010 and 2011 even though there were net increases in the values of capital employed. This suggests

that newer equipment may produce better yields in terms of sales than old equipment so that the argument of the Southern division manager may be only partly valid.

In both divisions for both years the operating cash flow is 25% of the turnover. This suggests that both divisions have the same gross profit percentages and the same operating costs to sales revenue percentages (or that their differences compensate for each other) if depreciation is ignored. Thus the differences between the divisions' profit to sales percentages between each other and between years is a function of the depreciation policy rather than of the actions of the divisional management.

(b)

Cost of Quality Report for the year ending 31 May 2011

	<i>Quantity</i>	<i>Rate</i>	<i>Total costs</i>
		\$	\$000
Prevention costs:			
Design engineering	66,000	75	4,950
Training			<u>150</u>
Total prevention costs			5,100
Appraisal costs:			
Inspection (manufacturing)	216,000	40	8,640
Product testing			<u>49</u>
Total appraisal costs			8,689
Internal failure costs:			
Rework (manufacturing)	1,500	3,000	<u>4,500</u>
Total internal failure costs			4,500
External failure costs:			
Customer support (marketing)	1,800	200	360
Transportation costs (distribution)	1,800	240	432
Warranty repair	1,800	3,200	<u>5,760</u>
Total external failure costs			6,552
Total costs (P, A, IF and EF)			24,841
Opportunity costs	1,400	6,000	<u>8,400</u>
Total quality costs			<u>33,241</u>

The Senior Examiner for P2 Performance Management offers to future candidates and to tutors using this booklet for study purposes, the following background and guidance on the questions included in this examination paper.

Section A – Compulsory

Question One The question examines candidates' knowledge and understanding of the learning curve and how it links with target costing. The learning outcomes tested are B1 (e) *apply learning curves to estimate time and cost for new products and services* and 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.*

Question Two The question examines candidates' knowledge of Kaizen Costing and performance reporting. The learning outcomes tested are B1 (c) *explain the concepts of continuous improvement and Kaizen costing that are central to total quality management* and C2 (c) *evaluate performance using fixed and flexible budget reports.*

Question Three This question examines candidates' knowledge of Value Analysis and Functional Cost Analysis. The learning outcomes tested are B1 (a) *compare and contrast value analysis and functional cost analysis* and B1 (g) *explain how process re-engineering can be used to eliminate non-value adding activities and reduce activity costs.*

Question Four The question examines candidates' understanding of feedforward control and feedback control in the context of a cash budget. The learning outcome tested is C1 (a) *explain the concepts of feedback and feed-forward control and their application in the use of budgets for planning and control.*

Question Five The question examines candidates' knowledge of the Balanced Scorecard in the context of an airline company. The learning outcome tested is C3 (c) *compare and contrast traditional approaches to budgeting with recommendations based on the balanced scorecard.*

Section B – Compulsory

Question Six The question examines candidates' knowledge and understanding of relevant costs in the context of a special order decision. It then tests candidates' knowledge of transfer pricing policies and their effect on performance measurement. The learning outcomes tested are A1 (b) *discuss the possible conflicts between cost accounting for profit reporting and stock valuation and information required for decision making*, 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* and D3 (c) *discuss the likely consequences of different approaches to transfer pricing for divisional decision making, divisional and group profitability, the motivation of divisional management and the autonomy of individual divisions.*

Question Seven The question examines candidates' understanding of performance ratios and quality costs. The learning outcomes tested are D1 (a) *discuss the use of cost, revenue, profit and investment centres in devising organisation structure and in management control*, D2 (c) *discuss alternative measures of performance for responsibility centres* and B1 (d) *prepare cost of quality reports.*
