

CA



THE INSTITUTE OF
CHARTERED ACCOUNTANTS
OF SRI LANKA

SUGGESTED SOLUTIONS

KB 2 – Business Management Accounting

June 2016

Answer 01

Relevant Learning Outcome/s: 1.3.1
Analyse the applicability of "target costing" and "life cycle costing" for costing and pricing decisions.

Suggested Detail Answer:

		<u>Rs.'000</u>
(a)	Target operating income	384 000 x 25% 96,000
	Total fixed cost	140,800
	Contribution	<u>236,800</u>
	Contribution per room night	236,800/16 14,800
	Variable cost per room night	<u>1,200</u>
	Price to be charged per room night	<u>16,000</u>
	Variable cost per room night	1,200
	Fixed cost per room night	<u>8,800</u>
	Full cost per room night	10,000
	Markup	<u>6,000</u>
	Selling price	<u><u>16,000</u></u>
	Percentage markup	6000/10000 60%

Alternative Answer

Variable cost	1200 x 16000	19,200
Fixed cost		140,800
Full cost		160,000
Markup =ROI		
384mn x 25%		96,000
Percentage markup		96000/160000*100
		60%

- (b) In Life Cycle Costing, (LCC) costs incurred throughout the life cycle of a product/service should be considered and recovered in pricing. Otherwise the company will not be able to be sustainable in the long run.

Therefore in the context of LCC, marketing costs and refurbishment costs should be considered in first year pricing.

The impact would be as follows:

		Rs.
Room night sales in the next 2 years	$(16+17) \times 1000$	33,000
Marketing cost per room night	$(16,500,000/33,000)$	500
Room nights in the next 5 years	$(16+17+18+19+20) \times 1000$	90,000
Refurbishment cost per room night	$(45,000,000/90,000)$	500
Total impact on first year pricing		<u>1,000</u>

The selling price should be increased by Rs. 1,000

If students have demonstrated the rationale behind the life cycle costing i.e. a particular cost generates return for more than one year and have estimated the total cost for a reasonable time period (which may be different from the model answer), allocated marks can be given for that presentation. Students may produce the answer covering the cost for five years i.e. marketing cost for two and half years and refurbishment cost for five years and also with or without the other costs for 5 years those also can be considered as applicable answers. If students have reached the rational conclusion based on that answer that too can be considered as an appropriate answer.

(Total: 10 marks)

Answer 02

Relevant Learning Outcome/s: 2.3.1/2.3.2
2.3.1. Assess the value of benchmarking in planning and control internal and external.
2.3.2 The importance of balanced scorecard as a strategic planning and control technique.

Suggested Detail Answer:

(a) Points expected to be covered in the answer are;

Identification of the strategy

- LPL's strategy is to focus on service oriented customers.
- Petrol is a commodity product but LPL wants to differentiate itself through the service they provide at the fuel stations.

Evaluation of whether the scorecard represents the strategy

- The focus of the scorecard is on measures of process improvement, quality, market share and financial success from product differentiation and premium price.
- The scorecard is on implementation of a product differentiation strategy.

Evaluation of LPL's performance relative to its strategy

- It has achieved all KPI other than the two KPI related to growth.
- Market share growth is measured with reference to the overall petrol market but LPL is focused on service oriented customers.

Therefore this measure may not be appropriate.

Based on the above we could say, that by and large, LPL has achieved its strategy in 2015.

(b) Areas to be improved

- 1 BSC should include some measure of employee satisfaction along with their training and development. This is significant as the customer will not get a satisfactory service unless the employees are trained and they are satisfied.
- 2 Market share measure should be based on the 60% service oriented customers. This is significant as LPL focuses on that 60% of the market and not the entire 100% market.
- 3 Internal process should include fuel station performance related measure as well. Presently it covers only refinery process but fuel station performance is critical to provide a satisfactory service.

(Total: 10 marks)

Answer 03

Relevant Learning Outcome/s: 3.3.1
Assess the further processing decisions under processes anomalies, joint products and by-products

Suggested Detail Answer:

	Total (Rs.million)	Chemical A	Chemical B	Chemical C
(a)				
Raw materials	17.50			
Labour	5.50			
Variable overheads	2.50			
Fixed overheads	4.40			
Total cost (before sales of by products)	29.90			
Less: sales of by products	(0.40)	(Note 01)		
Total cost	29.50			
Selling price (per kg.) (Note 02)		Rs.450.00	Rs.750.00	Rs.1,500.00
Sales quantity (kg)		50,000	10,000	5,000
Sales (Rs. million)	37.50	22.50	7.50	7.50
Cost allocation (Note 03)(Rs. million)		17.70	5.90	5.90
Profit (Rs. million)	8.00	4.80	1.60	1.60

Note 01

Proceeds from sale of by-product should be reduced from total cost common for all products.

Note 02

APL should increase the selling prices of Chemical B and C to the market selling price. The marks are given for selecting the correct prices.

Note 03

Since there are substantial differences among prices of chemicals the output method is not recommended to allocate costs. Instead the sales at split off method should be used.

(b) • If further processed 100%	(Rs.'000)
Cost for further processing (Chemical AX)	
Total variable cost	6,000.00
Incremental fixed overheads	4,000.00
Total incremental cost	<u>10,000.00</u>
 Increase in price (700-450)	 12,500.00
Increase in profit	<u>2,500.00</u>
 B2C division	
Additional cost to acquire 25,000 kgs of Chemical A	1,125.00
Net benefit to APL as a whole	<u>1,375.00</u>
 • If further processed only 50%	(Rs.'000)
Increased cost of B2B	
Variable cost	3,000.00
Incremental FC	4,000.00
	<u>7,000.00</u>
 Increase in price (250*25000)	 6,250.00
Net loss if only 50% further processed	<u>(750.00)</u>

Recommendation

Since further processing of 100% of the product A to AX generates an additional benefit of Rs. 1.375 million, 100% of A should be further processed.

(Total: 10 marks)

Answer 04

Relevant Learning Outcome/s: 4.3.1
Assess divisional performance using Return on Investment (ROI), Residual income (RI) and Economic value Added (EVA)

Suggested Detail Answer:

(a) Merits and Demerits

- ROI combines revenue, cost and investment into a single number so that the managers can clearly determine the areas for improvement and their impact.
- On the other hand when ROI is used, managers always could reject investments yielding returns less than current returns even if the NPV is positive i.e. will accept only new investments that will increase the ROI. (Tend to keep depreciated assets rather than investing in new assets).
- RI has the advantage of goal congruence, that investments with positive NPV would not be rejected. However the required return on investment needs to be appropriately determined.
- Residual income will increase when investment's earning above cost of capital are undertaken and investments earning below the cost of capital eliminated. RI is more flexible since different costs of capital can be applied to investments with different risk characteristics.
- RI does not facilitate comparisons between investment centres. Does not relate the size of a centre's income to size of the investment.

(b) Clothing manufacturing division

		Rs. million
Post tax operating income	150 x 80%	120
Investment		600
ROI	120 / 600	<u>20%</u>
Post tax operating income	150 x 80%	120
Required return on investment 600 x 12%		<u>72</u>
Residual income (RI)		<u>48</u>

Cosmetics division

		Rs. million
Post tax operating income	400 x 80%	320
Investment		2,000
ROI	320 / 2,000	<u>16%</u>
Post tax operating income	400 x 80%	320
Required return on investment 2,000 x 12%		<u>240</u>
Residual income (RI)		<u>80</u>

Alternate answer for part (b)

The return may also be computed by proportionately distributing the cost of brand awareness among the four years equally (Rs. 30mn each year). The value of the investment in this case should also be adjusted accordingly.

Clothing manufacturing division

		Rs. million
Investment	600	470 (600-220+90)
Pre-tax operating income	150	240 (150+120-30)
Post tax operating income		192
ROI		41%
Post tax operating income		192
Required return on investment $470 \times 12\%$		56
Residual income (RI)		136

(c) Appropriateness of ROI and RI

Clothing division generates 20% on invested capital whereas Cosmetic division generates only 16%. But the RI of Cosmetic division is much greater than that of Clothing division.

If LF's opportunity cost for investment in the cosmetic division is greater than 16% then LF must strive to earn a higher return from such investment. In such a situation evaluating performance based on ROI is appropriate.

If LF does not have any other investment opportunities which would yield more than 16% or LF cannot run the fashion business without the cosmetic business then pressurising managers for higher ROI is not appropriate. RI is a better measure at this point.

(d)

<u>Calculation of EVA of Clothing division</u>		Rs.million
Investment		600
Less Current liabilities		(220)
Add cost of brand awareness campaign		120
Amortisation		(30)
Adjusted investment		<u>470</u>
Operating income		150
Add: written off brand awareness cost		120
Amortisation of brand awareness campaign cost $120 \times 1/4$		(30)
Adjusted operating income		240
Tax @ 20%		(48)
Post-tax adjusted operating income		<u>192</u>
<u>EVA</u>		Rs. million
Post-tax adjusted operating income		192
Capital charge	$470 \times 10\%$	(47)
		<u>145</u>

(Total: 10 marks)

Answer 05

Relevant Learning Outcome/s: 5.1.1/5.1.2
5.1.1. Define the term "working capital management".
5.1.2. Discuss cash management options (surplus and deficit managing options)

Suggested Detail Answer:

(a) Working capital requirement

	Rs. million
Inventory (W1)	15.00
Debtors (12.5*3) (Refer Note)	37.50
Creditors (7.5*1)	<u>(7.50)</u>
Additional working capital	<u>45.00</u>

W1 - Inventory

Turnover (monthly) (150/12)	12.50
Inventory value per month (12.5*60%)	7.50
02 month inventory	15.00

The value of debtors can also be computed excluding the profit margin which is Rs. 37.50mn*60% = Rs. 22.5mn.

- (b)
- Arranging a bank overdraft facility.
 - Negotiation with supplier to further extend the credit period.
 - Factoring of debtors.
 - Short term bank loan facility.
 - Early settlement incentives for debtors.
- (c)
- Minimisation of cost of financing working capital requirement.
 - Minimisation of occurrence of bad debts.
 - Elimination of stock out situation.
 - Strengthening of supplier relationships.
 - Leads to a smooth operation within the company.
 - Helps to run a sustainable business, and external recognition.

(Total: 10 marks)

Answer 06

Relevant Learning Outcome/s: 1.1.2/1.1.4/2.2.2	
1.1.2.	Demonstrate how overheads are related to end products/services using absorption costing method (flat rate used with no allocation or apportionment or re-allocation expected) and ABC method (multiple drivers used).
1.14.	Evaluate the importance of ABC in planning and control (Activity Based Budgeting) and management (Activity Based Management)
2.2.2	Discuss the factors to be considered when deciding whether to investigate a variance or not

Suggested Detail Answer:

Table 1 (For information purpose only)				
	<i>Beverages</i>	<i>Fresh Products</i>	<i>Packaged food</i>	<i>Support costs (Rs.'000)</i>
<i>Revenue (Rs. '000)</i>	<i>63,480</i>	<i>168,048</i>	<i>96,792</i>	
<i>Cost of goods sold (Rs. '000)</i>	<i>48,000</i>	<i>120,000</i>	<i>72,000</i>	
<i>Cost of bottles returned (Rs. '000)</i>				<i>960</i>
<i>No. of purchase orders placed</i>	<i>144</i>	<i>336</i>	<i>144</i>	<i>12,480</i>
<i>No. of deliveries received</i>	<i>120</i>	<i>876</i>	<i>264</i>	<i>20,160</i>
<i>Hours of shelf stocking time</i>	<i>216</i>	<i>2,160</i>	<i>1,080</i>	<i>13,824</i>
<i>Items sold</i>	<i>50,400</i>	<i>441,600</i>	<i>122,400</i>	<i>24,576</i>
				<i>72,000</i>

(a) According to present cost allocation basis

	Beverages	Fresh Products	Packaged food	Total
Revenue (Rs. '000)	63,480	168,048	96,792	328,320
Cost of goods sold (Rs. '000)	48,000	120,000	72,000	240,000
Allocated Support costs (Rs. '000)	14,400	36,000	21,600	72,000
Operating profit (Rs. '000)	1,080	12,048	3,192	16,320
% of operating profit to revenue	1.70%	7.17%	3.30%	4.97%

According to Activity Based Costing system

	Beverages	Fresh Products	Packaged food	Total
No. of purchase orders placed	144	336	144	624
No. of deliveries received	120	876	264	1,260
Hours of shelf stocking time	216	2,160	1,080	3,456
Items sold	50,400	441,600	122,400	614,400
<u>Support costs (Rs. '000)</u>				
Related to bottle returns	960	-	-	960
Related to ordering	2,880	6,720	2,880	12,480
Related to delivery	1,920	14,016	4,224	20,160
Related to shelf stocking	864	8,640	4,320	13,824
Related to customer support	2,016	17,664	4,896	24,576
	8,640	47,040	16,320	72,000
Revenue (Rs. '000)	63,480	168,048	96,792	328,320
Cost of goods sold (Rs. '000)	48,000	120,000	72,000	240,000
Allocated Support costs (Rs. '000)	8,640	47,040	16,320	72,000
Operating profit (Rs. '000)	6,840	1,008	8,472	16,320
% of operating profit to revenue	10.78%	0.60%	8.75%	4.97%

(b)

- Allocation of support costs based on COGS results in allocating costs related to bottle returns to fresh products and packaged goods where there is no relevance at all.
- The present basis results in allocating only 50% of the support costs to fresh products whereas that product line requires highest level of support and 65% of the support costs under ABC.
- Under the present basis, fresh products turns out to be the product line with best operating margin whereas under ABC it has only 0.60% margin which is the lowest.

(c)

According to present cost allocation basis fresh products line would get preference in allocation of extra space as it generates the highest margin. But in reality any extra space for fresh products will require further support and therefore support cost could increase. As ABC shows that fresh products is the least profitable product line, allocation of additional store space to the fresh products based on present cost allocation basis would have reduced QSF's profitability. Further the ABC shows that the other product lines are more profitable and therefore extra space needs to be allocated for them. The correct approach can be taken only if ABC is used to calculate profitability.

According to present cost allocation basis, beverages and packaged foods generate margins of 1.7% and 3.3% respectively. With these margins one could conclude there is very little possibility of reducing prices. But ABC reflects the correct margins of 10.78% and 8.75% which have room for a price reduction. Accordingly ABC would enable the management in making the right decisions with respect to its pricing strategy.

(d) (i)

- It is activities which drive costs and the aim is to control the causes (drivers) of costs rather than the costs themselves, with the result that in the long term, costs will be better managed and better understood.
- Not all activities are value adding and so activities must be examined and split up according to their ability to add value.
- Most departmental activities are driven by demands and decisions beyond the immediate control of the manager responsible for the department's budget.
- Traditional financial measures of performance are unable to fulfil the objective of continuous improvement. Additional measures which focus on drivers of costs, the quality of activities undertaken, the responsiveness to change and so on are needed.

(ii) Benefits of ABB

- Different activity levels will provide a foundation for the "base" package and incremental packages of Zero Based Budgeting (ZBB).
- It will ensure that the organisation's overall strategy and any actual or likely changes in that strategy will be taken into account, because it attempts to manage the business as the sum of its interrelated parts.
- Critical success factors will be identified and performance measures devised to monitor progress towards them. (A critical success factor is an activity in which a business must perform well if it is to succeed.)
- Because concentration is focused on the whole of an activity, not just its separate parts, there is more likelihood of getting it right first time. For example, what is the use of being able to produce goods in time for their dispatch date if the budget provides insufficient resources for the distribution manager who has to deliver them?
- Contributes to elimination of non-value adding activities.
- Activity unit cost allows easier analysis of cost trends over time.

(Total: 25 marks)

Answer 07

Relevant Learning Outcome/s: 3.5.1/3.7.2	
3.51	Demonstrate optimal solutions (profit maximising or cost minimising) under multiple constraints (graphically, identify decision variables, develop linear programming model, solve and interpret/simplex tableau, only forming the initial tableau)
3.7.2	Compute non-discounted cash flow methods (payback/accounting rate of return) and discounted cash flow methods (net present value/internal rate of return/profitability index/discounted payback)with - inflation - tax - uncertainty (use of probabilities and sensitivity analysis is expected)

Suggested Detail Answer:

- (a) If machine time available is M, then $1.5P + Q = M$
When $Q = 0$, $P = 22,400$ (from the graph) and $M = 1.5 \times 22,400 + 0 = 33,600 \text{ min} = 560 \text{ hours}$

If quality checking time available is T, then $2P + 4Q = T$
When $Q = 0$, $P = 33,600$ (from the graph) and $T = 2 \times 33,600 + 0 = 67,200 \text{ min} = 1,120 \text{ hours}$

If common material available is CM, then $0.12P + 0.1Q = CM$
When $Q = 30,000$, $P = 0$ (from graph) and $CM = 30,000 \times 0.1 + 0 = CM = 3000 \text{ kg}$

- (b) The objective function is Max: $C = 100P + 200Q$
Gradient of this function (with P on x and Q on y) is $100/200 = 0.5$

Gradient of FG line (which represents $2P + 4Q = T$) is $2/4 = 0.5$

Since the gradients of objective function and FG are equal, they are parallel and overlap on each other. Therefore any point on FG within the boundary of the feasible area is optimum.

Alternatively

Equation of line FG: $2P + 4Q = 67,200$

Equation of objective function: $C = 100P + 200Q$

In other words, $C = 50(2P + 4Q)$

Since $2P + 4Q = 67,200$, $C = 50(67,200)$ which $= 3,360,000$

Therefore any point on FG within the boundary of the feasible area is optimum.

- (c) At point F, $P = 10,000$ and therefore using quality checking equation $2P + 4Q = 67,200$

$$Q = (67,200 - 2 \times 10,000) / 4 = 11,800$$

$$\text{Therefore optimum contribution} = 100 \times 10,000 + 200 \times 11,800 = \text{Rs. } 3,360,000$$

Hence, business analyst's statement is correct.

- (d) FG represents the quality checking time which is binding, whatever the optimum point selected. If point G is selected then machine time is a binding resource along with quality checking time.

At point G quality time and machine time will be binding.

At all other points quality time will be the only binding resource.

- (e) Optimal product mix;
 $P = 10,000$
 $Q = 16,567$

Contribution = Rs. 6,470,000/- per month

Unutilised resources

Machine time 186.25 Hours
 Common materials 143 kgs.

Binding resource = Quality checking time

- (f) Computation of Net Present Value

	(Rs.'000)				
	Year 00	Year 01	Year 02	Year 03	Year 04
Cost of new machine	(100,000)	-	-	-	10,000
Sale of old machine	5,000	-	-	-	-
Tax on sale of old machine		(1,250)			
Cost saving	-	5,000	5,000	5,000	5,000
Additional contribution	-	37,320	37,320	37,320	37,320
CF before tax	(95,000)	41,070	42,320	42,320	52,320
Taxation		(1,934)	(2,247)	(2,247)	(13,080)
NCF	(95,000)	39,136	40,073	40,073	39,240
DF @ 20%	1.0000	0.8333	0.6944	0.5787	0.4823
PV	(95,000)	32,613	27,829	23,191	18,924
NPV	7,556				

Since NPV is positive the purchase of new machine is financially recommendable.

Tax liability	(Rs.'000)			
	Year 01	Year 02	Year 03	Year 04
Income	41,070	42,320	42,320	52,320
Dep allowance	(33,333)	(33,333)	(33,333)	-
Taxable income	7,737	8,987	8,987	52,320
Taxation @25%	1,934	2,247	2,247	13,080

(g) Quality time is no longer a constraint.

∴ Need to calculate optimal product mix with the other two constraints.

Machine time – available 560 hours = 33,600 minutes

Material – available 3,000 kg.

Per unit	P	Q	R
Contribution	150	300	200
Machine time	1	0.75	0.50
Contribution/machine min	<u>150</u>	<u>400</u>	<u>400</u>
Rank	<u>3</u>	<u>1</u>	<u>1</u>
Material	.12	.10	.05
Contribution/material kg	1250	3000	4000
Rank	3	2	1

Note: Contribution for OT premium could also be adjusted, still the rankings remain the same. R has the highest rank with respect to both resource constraints.

Resources consumed in production of P (10,000 units)

Machine time 10,000 minutes

Material 1,200 kg

Balance available for production of R - Machine time 23,600 minutes

Material 1,800 kgs.

Units of R that could be produced with the available resources.

(Machine time) $\frac{23,600}{0.5} = 47,200$ units

(Material) $\frac{1,800}{0.05} = 36,000$ units

Optimal production is P = 10,000 units
R = 36,000 units

Contribution = $10,000 \times 150 + 36,000 \times 200$ Less OT premium for
(371 $\frac{2}{3}$ hrs) (Note)
= Rs. 8.7m – 0.372m = Rs. 8.328 million

Additional profit by taking up the offer = Rs. 8.328m – 6.470m = 1.858 million

Note: Quality time used = $10,000 \times 1.75 + 36,000 \times 2 = 89,500$
Less available (67,200)
Overtime needed 22,300 minutes = 371 $\frac{2}{3}$ hrs.

Alternate answers

(e) From Simplex tableau,

Optimal product mix P = 10,000
Q = 16,567
Contribution (Rs.) = 6,470,000

Unutilized resources

Machine time = 11,175 minutes
Material = 143 kg

Alternatively;

From Simplex tableau

Production of 1 unit of R = Production of $\frac{2}{3}$ units of Q
Additionally will release $\frac{1}{60}$ kgs of material

$\therefore$ Optimal product mix P = 10,000
R = $\frac{16,567 \times 3}{2}$
R = 24,850 units

Unutilised material = $143 \text{ kg} + \frac{1}{60} \times 24,850$
= 557 kg

Contribution, machine time, quality checking time consumed remain the same.

(g) 557kg of material will produce $557 \times 20 = 11,140$ units of R.

11,175 minutes machine time will produce = $11,175 \times 2 = 22,350$ units of R.

Therefore, material will become the binding constraint at 11,140 units of R.

11,140 units of R will give contribution of $11,140 \times 200 = \text{Rs. } 2,228,000$.

11,140 units of R will need = $11,140 \times 2 = 22,280$ minutes of quality checking time.
(i.e.) $371 \frac{1}{3}$ hrs

The OT cost = $372 \times 1,000 = \text{Rs. } 372,000$

Additional profit = $\text{Rs. } 2,228,000 - 372,000$

= $\text{Rs. } 1.856$ million

(Total: 25 marks)

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