

CA



THE INSTITUTE OF  
**CHARTERED** ACCOUNTANTS  
OF SRI LANKA

# SUGGESTED SOLUTIONS

## **13304-Strategic Management Accounting**

CA Professional (Strategic Level I) Examination  
JUNE 2013

**THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA**

**Answer No. 01**

(a)	CC Division		CM Division
	Internal	External	External
Selling price (W1)	1,164	1,600	9,100
Qty to be sold (units)	<u>40,000</u>	<u>35,000</u>	<u>20,000</u>
Sales (Rs. '000)	<u>46,560</u>	<u>56,000</u>	<u>182,000</u>
Sales (Rs. '000)		102,560	182,000
Variable production cost (Rs. '000)		(56,250)	(90,000)
Variable selling & distribution cost (Rs. '000)		(4,550)	(13,000)
Fixed production cost (Rs. '000)		(16,500)	(22,500)
Fixed administration cost (Rs. '000)		<u>(3,000)</u>	<u>(8,000)</u>
Profit (Rs. '000)		22,260	48,500
Capital employed (Rs.'000)		160,000	280,000
ROCE		13.91%	17.32%

CC division transfers its output to CM Division at a price below the market price which will also cause CC Division to **underperform at lower ROCE (below 15%)**. **Only CM Division will be entitled to the incentive scheme due to internal transfer pricing**. Therefore the Manager of CC Division has disagreed for the current incentive scheme.

(7 marks)

<b>W1 = Internal transfer price of component A</b>	<b>Rs.</b>
Variable cost per unit	750.00
Fixed production cost	<u>220.00</u>
	970.00
20% mark up	<u>194.00</u>
Selling price	<u>1,164.00</u>

(b)

<b>CC Division</b>	<b>Rs. '000</b>
Capital employed	160,000
15% ROCE (eligibility criteria)	24,000
Current level of profit	22,260
Additional contribution/profit required	1,740

<b>Additional cont/unit from selling to external market</b>	<b>Rs.</b>
Selling price/unit to external market	1,600.00
Less: Selling price/unit of internal transfers	(1,164.00)
Less: Selling & distribution cost/unit	<u>(130.00)</u>
<b>Net loss/unit from selling internally</b>	<b>306.00</b>
<b>Addition external sales required</b>	<b>Units</b>
	<b><u>5,686.27</u></b>

(3 marks)

(c)

Additional external sales required (units of Component A)		5,686.27
<b>No. of units of motors to be foregone by Division CM (2 Comp. each motor)</b>		<b><u>2,843.14</u></b>
Per motor contribution (Rs.)		3,950.00
<b>Impact to the profit - decline in contribution (Rs. '000)</b>		<b>11,230.39</b>
Current level of profit (Rs. '000)		48,500.00
New profit (Rs. '000)		<u>37,269.61</u>
<b>Impact to the ROCE - New ROCE</b>		<b><u>13.3%</u></b>

(3 marks)

(d) (i)

	Component A	Motor
Variable cost to external market (Divisional)	880.00	5,150.00
Less - Transfer price	-	(2,328.00)
Add - Variable cost of component A (two units)	-	<u>1,500.00</u>
Variable cost per unit to the external market (Company)	<u>880.00</u>	<u>4,322.00</u>

Selling Price	External market		External market		Total Contribution. (Rs. '000)
	Motor Qty	Contribution (Rs. '000)	Comp. A Qty	Contribution (Rs. '000)	
9,100	20,000	95,560	35000	25,200	120,760
8,900	24,000	109,872	27000	19,440	129,312
<b>8,700</b>	<b>29,000</b>	<b>126,962</b>	<b>17000</b>	<b>12,240</b>	<b>139,202</b>
8,500	30,000	125,340	15000	10,800	136,140

	(Rs. '000)
<b>Optimal selling price per Motor</b>	<b>8,700</b>
<b>Quantity of Motors to be sold</b>	<b>29,000</b>
Total Contribution (both divisions)	139,202.00
<u>Less: Fixed Expenses</u>	
Total fixed production cost (both divisions)	(39,000)
Total fixed administration cost (both divisions)	(11,000)
<b>Profit for the company (both divisions)</b>	<b>89,202.00</b>

(8 marks)

(3)

(ii)

<b>Dual Rate Transfer Pricing System</b> <b>29,000 Motors to be sold at 8,700 each</b>	CC Division Rs. '000		CM Division Rs. '000
	Internal	External	External
Selling price (Rs.)	1,470	1,600	8,700
Qty to be sold (units)	58,000	17,000	29,000
Turnover	85,260	27,200	252,300
Total Turnover		112,460	252,300
Variable production cost		(56,250)	(106,488)
Variable selling & distribution cost		(2,210)	(18,850)
Fixed production cost		(16,500)	(22,500)
Fixed administration cost		(3,000)	(8,000)
Profit		34,500	96,462
Capital employed		160,000	280,000
ROCE		21.56%	34.45%
Since both divisions get the ROCE above 15%, respective managers will be satisfied.			

(5 marks)

(iii)

- \* It confuses the recording and accounting when there are many internal transfers
- \* This is considered to be artificial
- \* This method dilutes the divisional motivation to compete aggressively
- \* Misleading information on the overall performance of the company.
- \* Additional work for the reconciliation and setting off the artificial profits in the accounts

(2 marks)

(Total 28 marks)

**Answer No. 02**

- (a) (A) - When standard grade of main raw material is used  
 (B) - When cheaper grade of main raw material is used

	<b>Current cost (Rs.)</b>	<b>(A) (Rs.)</b>	<b>(B) (Rs.)</b>	
Raw material cost - Main RM	190.00	237.50	200.00	<b>W1</b>
Other RM	60.00	75.00	78.95	<b>W2</b>
Direct labour	100.00	110.00	125.00	<b>W3</b>
Variable overhead	50.00	60.00	60.00	
<b>Total variable cost</b>	<b>400.00</b>	<b>482.50</b>	<b>463.95</b>	

**W1 - Working 01**

Per unit material consumption	2.00	Kgs
Old price per Kg. (Rs.)	95.00	
Increased price (25%) (Rs.)	118.75	
Cheaper grade price (80%) (Rs.)	95.00	
Cost of 02 Kgs (Rs.)	190.00	
<b>5% Normal loss (divided by 95%)</b>	<b>200.00</b>	

**Or W1 - Working 01**

New standard main RM cost/ unit	237.50
If cheaper grade used before RM loss	190.00
<b>95% good output after 5% loss (190/95%)</b>	<b>200.00</b>

**W2- Working 2 - Other RM**

Other materials new cost	75.00
5% Normal Loss. (Divided by 95%)	<b>78.95</b>

**W3 - Working 3 - Direct Labour**

Increased direct labour @ 100%	Rs. 110.00
88% productivity level (divided by 88%)	Rs. <b>125.00</b>

(4 marks)

- (b)

**Calculation of existing price**

	<b>Per unit</b>
Current Variable Cost	400.00
Fixed Cost	100.00
	500.00
40% profit margin	200.00
<b>Current price</b>	<b>700.00</b>

**With the standard main material cost**

	Existing price (Rs.)	At Rs. 680 (Rs.)	At Rs. 650 (Rs.)
Selling Price	700.00	680.00	650.00
Revised total VC	<u>(482.50)</u>	<u>(482.50)</u>	<u>(482.50)</u>
Contribution	217.50	197.50	167.50
Sellable Qty	<u>30,000</u>	<u>35,000</u>	<u>43,000</u>
Total contribution	6,525,000	6,912,500	7,202,500
Less - Fixed cost	<u>(3,300,000)</u>	<u>(3,300,000)</u>	<u>(3,300,000)</u>
Net profit	<u>3,225,000</u>	<u>3,612,500</u>	<u>3,902,500</u>

**With the cheaper grade of main raw material**

	Existing price (Rs.)	At Rs. 680 (Rs.)	At Rs. 650 (Rs.)
Selling Price	700.00	680.00	650.00
Revised total VC	<u>(463.95)</u>	<u>(463.95)</u>	<u>(463.95)</u>
Contribution	236.05	216.05	186.05
Sellable Qty	<u>30,000</u>	<u>35,000</u>	<u>43,000</u>
Total contribution	7,081,579	7,561,842	8,000,263
Less - Fixed cost	<u>(4,110,000)</u>	<u>(4,110,000)</u>	<u>(4,110,000)</u>
Net profit	<u>2,971,579</u>	<u>3,451,842</u>	<u>3,890,263</u>

Profit is maximised at the selling price of Rs. 650/- with the standard main raw material.

(8 marks)

(c)

	<b><u>Rs.</u></b>	
Recommended price	650.00	
Total variable cost per unit if cheaper grade is used	<u>(463.95)</u>	
Contribution/unit	186.05	
Profit at optimal profit per (b) above	<b>3,902,500</b>	
Fixed cost with cheaper grade of main RM	4,110,000	
Minimum contribution required	<b>8,012,500</b>	
<b><u>By dividing contribution/unit;</u></b>		
<b>Minimum quantity to be produced</b>	<b><u>43,066</u></b>	<b>units</b>

(2 marks)

(d) Calculating of operating leverage

	<b>DMPL</b>		<b>Competitor</b>	
Contribution margin over operating income	<u>80</u>		<u>45</u>	
	<u>(80-20)</u>		<u>(45-10)</u>	
Operating leverage	<u><b>1.33</b></u>	times	<u><b>1.28</b></u>	times

Or

Change in operating income as % sales/	<u>8/60%</u>		<u>4.5/35%</u>	
Change in sales (Ex. 10% increase in sales)	10%		10%	
	<u>13.33%</u>		<u>12.90%</u>	
	10%		10%	
		1.33 times		1.29 times

- DMPL has a higher operating leverage compared to its competitor which means;
- DMPL can earn more operating income from increasing sales through good marketing than competitor.
- On the other hand DMPL is more vulnerable than competitor, to decline in revenue.

(4 marks)  
(Total 18 marks)

**Answer No. 03**

(a) Calculation of Contribution per kg

	X	Y	Z
Cost of Chemical A	300	300	600
Cost of Chemical B	120	240	120
Cost of Chemical C	480	240	240
Cost of Chemical D	120	120	120
Other manufacturing costs	<u>220</u>	<u>220</u>	<u>220</u>
	1,240	1,120	1,300
Contribution	<u>420</u>	<u>500</u>	<u>320</u>
Selling Price	<u>1660</u>	<u>1620</u>	<u>1620</u>

The LP model will be as follows:

Max:  $C = 420X + 500Y + 320Z$  subject to following constraints

Material A:  $0.1X + 0.1Y + 0.2Z \leq 1200$

Material B:  $0.1X + 0.2Y + 0.1Z \leq 2000$

Material C:  $0.2X + 0.1Y + 0.1Z \leq 2200$

(3 marks)

(b)

Variable	Decision Variables			Slack Variables			Solution
	X	Y	Z	a	b	c	
a	0.1	0.1	0.2	1	0	0	1200
b	0.1	0.2	0.1	0	1	0	2000
c	0.2	0.1	0.1	0	0	1	2200
C	420	500	320	0	0	0	0

A slack variable represents the unused quantity of a resource, availability of which, is limited

(2 marks)

(c) Interpretation of the final matrix

(i) Optimum Solution

Quantity of X	4000 kg
Quantity of Y	8000 kg
Quantity of Z	0 kg
Total Contribution (Rs)	5.68 Mn

(ii) Resource utilization

Chemical A	Fully utilised
Chemical B	Fully utilised
Chemical C	600 kg not utilised

- (iv) Effect of production of an item not in the optimum mix  
Z is not in the optimum mix. Production of any unit of Z will cause a loss of Rs. 440 per kg in contribution
- (v) Decrease in production of X by 3 units  
Increase in production of Y by 1 unit  
Decrease in Contribution by Rs 440  
Increase in unutilised quantity of C by 0.4kg
- (vi) Impact on the optimum mix if additional 1kg of A is available  
Increase in production of X by 20 units  
Decrease of production of Y by 10 units  
Increase in contribution by Rs 3400  
Decrease in unutilised quantity of C by 3kg
- (vii) Impact on the optimum mix if additional 1kg of B is available  
Decrease in production of X by 10 units  
Increase of production of Y by 10 units  
Increase in contribution by Rs 800  
Increase in unutilized quantity of C by 1kg
- (d) (i) Impact if additional 100kg of A is available  
Increase in production of X by  $100 \times 20 = 2000\text{kg}$   
Decrease of production of Y by  $100 \times 10 = 1000\text{kg}$   
Increase in contribution by  $100 \times 3400 = \text{Rs } 340,000$
- (ii) Decrease in production of X by  $3 \times 200 = 600\text{kg}$   
Increase in production of Y by  $1 \times 200 = 200\text{kg}$   
Decrease in Contribution by  $\text{Rs } 440 \times 200 = \text{Rs } 88000$   
Increase in utilized quantity of C by  $0.4 \times 200 = 80\text{kg}$
- (iii) The premium on price Rs 1000 is less than the shadow price  
Therefore the offered price is acceptable  
However with additional 500kg of A, C will be exhausted  
Therefore it is recommended to accept only 200kg of A
- (iv) The premium on price Rs 2000 is more than the shadow price  
Therefore the offered price is not acceptable  
Therefore it is not recommended to accept the offer

(9 marks)

(4 marks)

(Total 18 marks)

**Answer No. 04**

(a) Pay off table (Rs Mn)

Strategy	Outcomes			
	O-1	O-2	O-3	O-4
S-1	60	60	60	60
S-2	68	64	60	32
S-3	64	62	60	46

(i) **Maxi - Min Rule**

Strategy	Min pay off
S-1	60
S-2	32
S-3	46
Strategy with highest of the minimum pay offs is S-1	

(ii) **Maxi - Max Rule**

Strategy	Max pay off
S-1	60
S-2	68
S-3	64
Strategy with highest of the maximum pay offs is S-2	

(iii) **Min - Max Regret Rule**

The regret table will be as follows (Rs Mn)

Strategy	Outcomes				Maximum Regret
	O-1	O-2	O-3	O-4	
S-1	8	4	0	0	8
S-2	0	0	0	28	28
S-3	4	2	0	14	14
Strategy which minimises maximum regret is S-1					

(8 marks)

(b) **Maxi- Min and Min - Max Regret Rules are risk averse criteria whereas Maxi- Max rule is an optimistic high risk criterion**

(2 marks)

- (c) The expected pay offs are as follows

Strategy	Outcomes / Probabilities				Expected Pay off
	O-1	O-2	O-3	O-4	
	0.2925	0.1575	0.3575	0.1925	
S-1	60	60	60	60	60.00
S-2	68	64	60	32	57.58
S-3	64	62	60	46	58.79

S-1 has the highest expected pay off which is Rs 60 Mn. Therefore S-1 is recommended.

(5 marks)

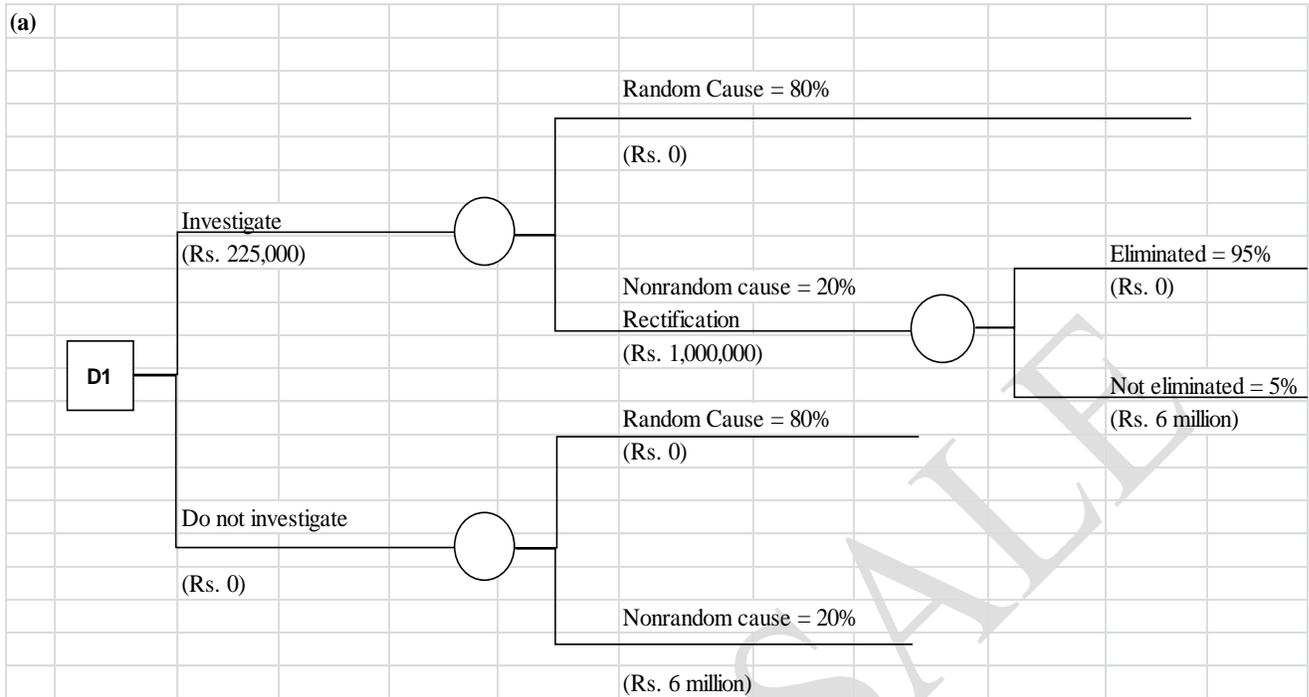
- (d) If perfect information is available the expected pay offs will be as follows

Rs Mn			
	Max Pay off	Probability	Exp Pay off
O-1	68	0.2925	19.89
O-2	64	0.1575	10.08
O-3	60	0.3575	21.45
O-4	60	0.1925	<u>11.55</u>
			<u>62.97</u>

Value of Perfect Information =  $62.97 - 60 = \text{Rs. } 2.97 \text{ Mn}$

(3 marks)

**Answer No. 05**



Evaluation based on the expected cost

If investigated (Rs.) = 225,000 + [(1,000,000 + 6,000,000 \* 5%)\*20%] = Rs. 485,000

If not investigated (Rs.) = 6,000,000 \* 20% = 1,200,000

If investigated the loss would be lower than not investigating. Therefore it is advisable to investigate all variances and to correct variances stemmed from nonrandom causes.

(12 marks)

(b) Probability of indifference

Assuming the probability of the cause to be nonrandom occurrence is X

$$225,000 + (1,000,000 + 6,000,000 * 5%) X = 6,000,000X$$

$$X = 4.79\%$$

If the cause for variance being random variable at the probability of more than 95.21% (1 - 4.79%), it is not worth investigating future variances.

(3 marks)

(c) Measurement errors

For example labour hours for a particular operation may be incorrectly added up. Incorrect classification of indirect labour cost is classified as direct labor costs.

Out-of-date standard

Due to the changes in the technology or fail to take into account the learning curve effect will leads to standards being out of date.

### Out-of-control operation

Variance can be due to inefficient operations for example failure to follow the given procedures, faulty machinery, or human errors.

(3 marks)

### Answer No. 06

(a)

(1) Environmental prevention costs

These are the costs of activities undertaken to prevent the production of waste that could cause damage to the environment

e.g. \* costs associated with the design and operation of processes to reduce contaminants  
\* training employees  
\* recycling products

(2) Environmental appraisal costs

These are the costs incurred to ensure that a firm's activities, products and processes conform to regulatory laws and standards

e.g. \* inspection of products and processes to ensure compliance  
\* auditing environmental activities  
\* Performing contamination tests

(3) Environmental internal failure costs

These are the costs incurred from performing activities that have been produced but not discharged in to the environment. such costs are incurred to eliminate or reduce waste to levels that comply with regulatory requirements

e.g. \* costs of disposing of toxic materials  
\* costs of recycling scrap

(4) Environmental external failure costs

These are the costs incurred on activities performed after discharging waste into the environment.

e.g. \* costs of cleaning up contaminated soil  
\* restoring land to its natural state  
\* cleaning up oil spills and waste discharges

(8 marks)

(b) Life Cycle Costing

Traditional management accounting procedures primary focus on the manufacturing stage of product life cycle. As a result, certain relevant cost elements such as,

Pre manufacturing stage expenses e.g. research and development expenditure.

Post manufacturing expenses such as abandonment and disposal cost were omitted in the pricing process.

To avoid this risk, life cycle costing was introduced under this all relevant costs from product design stage to disposal stage are considered in product costing.

(2 marks)

(c) (i)

Cost driver rates

Product design – 6Mn / 4000 hr = 1500 per design hour

Purchasing – 600k / 2000 orders = 300 per order

Production (excl depn) – 3.6Mn / 6000 hr = 600 per machine hour

Packing – 1.2Mn / 10000 cm = 120 per cubic meter

Distribution – 1.8Mn / 60000 kg = 30 per kg

Overhead cost per unit				Rs		
Product design (200 x 1500 / 5000)		(1)	60			
Depreciation (25000 x 8 / 5000)		(1)	40			
Purchasing [(250/50) x 300 / 250]			6			
Production (0.375 x 600)		('1/2)	225			
Packing (0.4 x 120)		}	48			
Distribution (3 x 30)			('1/2)	90		
Total Cost				469	('1/2)	

(6 marks)

(ii)

Selling Price

Rs. 550

Profit Margin

25%

Target cost = Rs. 550 x  $\frac{100}{125}$  = Rs. 440

(2 marks)

(Total 18 marks)

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