

CA



THE INSTITUTE OF
CHARTERED ACCOUNTANTS
OF SRI LANKA

SUGGESTED SOLUTIONS

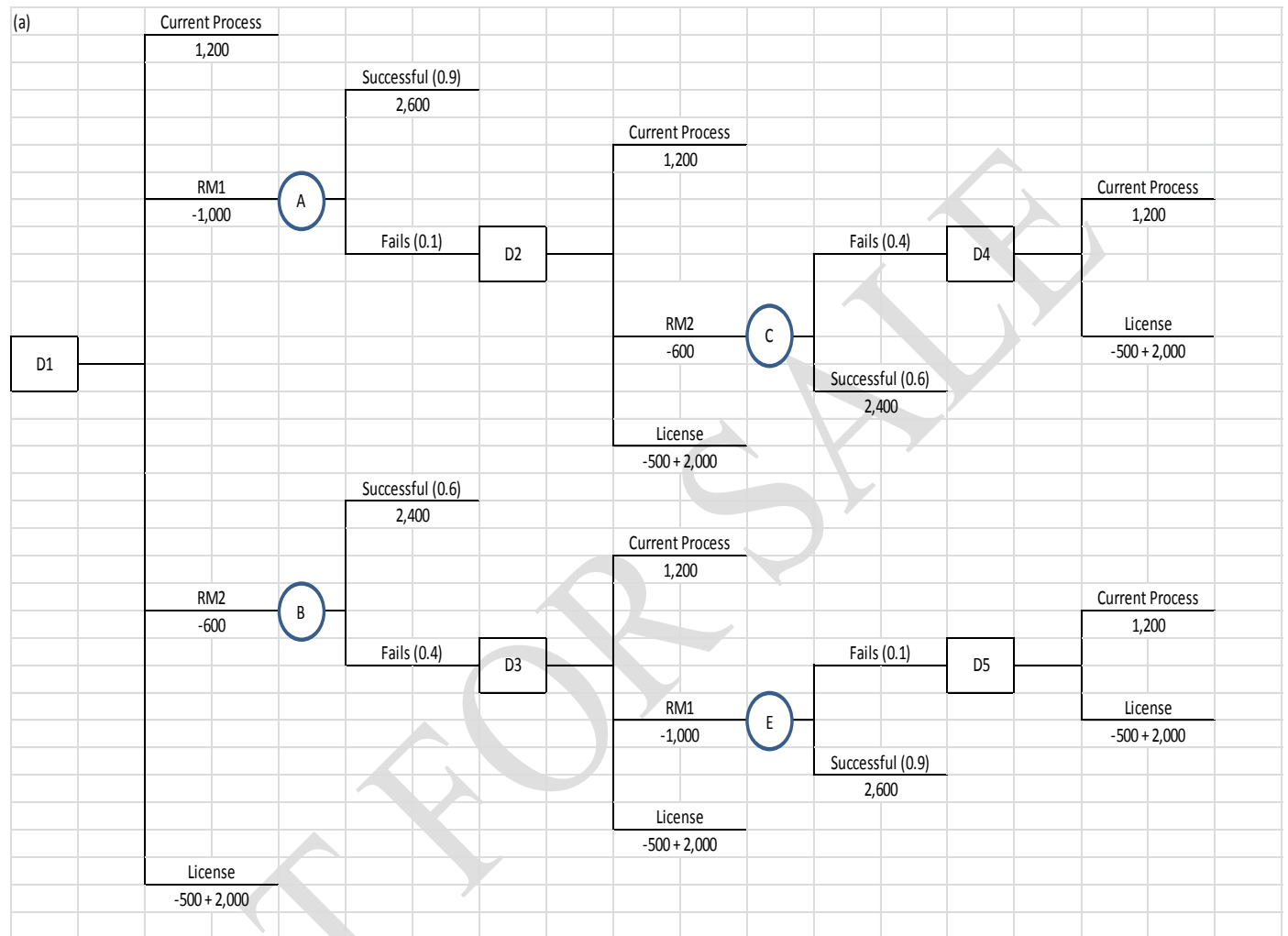
13304-Strategic Management Accounting

CA Professional (Strategic Level I) Examination
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THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA

Answer No. 01

Part A



EV of D4	Higher of [1,200 (current process) and 1,500 (License)]	=	1,500
EV of C	$1,500(D4) \times 0.4 + 2,400 \times 0.6$	=	2,040
EV of D2	Higher of [1,200 (current process), 2,040(EV of C) - 600 (RM2) and 1,500 (License)]	=	1,500
EV of A	$2,600 \times 0.9 + 1,500 (D2) \times 0.1$	=	2,490
EV of RM1 @ D1	$2,490 - 1,000$	=	1,490
EV of D5	Higher of [1,200 (current process) and 1,500 (License)]	=	1,500
EV of E	$1,500(D5) \times 0.1 + 2,600 \times 0.9$	=	2,490

EV of D3	Higher of [1,200 (current process), 2,490(EV of E) - 1,000 (RM1) and 1,500 (License)]	=	1,500
EV of B	2,400 x 0.6 + 1,500 (D3) x 0.4	=	2,040
EV of RM2 @ D1	2,040 - 600	=	1,440
EV of D1	Higher of [1,200 (current process); 1,490 (RM1); 1,440 (RM2) and 1,500 (Licence)]	=	1,500

Thus MFP should apply the preservation method of the other company at a cost of Rs. 0.5 Mn

PART B

(a) (i) Calculation of value of 'a'

Since the average cost of the first year is Rs 300 for 50,000 units

In the equation $Y = aX^b$

$$\begin{aligned}
 Y &= 300 \\
 X &= 50,000 \\
 b &= -0.322 \\
 a &= Y / X^b = 300 / 50,000^{(-0.322)} \\
 &= 9,777
 \end{aligned}$$

(ii) Estimation of labour cost

Year	No. of Units	Cum Units (X)	Y	Cum Cost	Cost for the year	inflation Factor	inflated cost
Year 1	50,000	50,000	300	15,000,000	15,000,000	1.00	15,000,000
Year 2	55,000	105,000	236	24,805,954	9,805,954	1.06	10,394,312
Year 3	60,000	165,000	204	33,701,072	8,895,117	1.06 ²	9,994,554
Year 4	65,000	230,000	184	42,212,500	8,511,428	1.06 ³	10,137,247

(b) Estimation of Cash Flows and calculation of NPV

	Sales Units	Sales	Material	Labour	FPAC	Scrap Value	Net Cash Flow	PV @ 12% COC
Inflation		5%	8%	6%	8%			
Year 1	50,000	50,000,000	27,500,000	15,000,000	7,500,000		-	-
Year 2	55,000	57,750,000	32,670,000	10,394,312	8,100,000		6,585,688	5,250,070
Year 3	60,000	66,150,000	38,491,200	9,994,554	8,748,000		8,916,246	6,346,408
Year 4	65,000	75,245,625	45,034,704	10,137,247	9,447,840	1,000,000	11,625,834	7,388,428
PV of future cash flows								18,984,906

(c) Memo should cover the following points

(i) Based on the calculations above the maximum investment should not exceed Rs 18.98 Mn

(ii) Risk Factors

- Ability to maintain COC @ 12% consistently throughout the period
- Ability to achieve 80% learning impact
- Feasibility of achieving the sales volumes as forecasted
- Possibility of changes in inflation rates
- Validity of considering all cashflows as of end of each year
- Whether all cost factors have been captured in the estimations
- How would tax implications apply

Answer No. 02

(a)

	Alpha (A)	Beta (B)	Ceta (C)	Delta (D)	
X	6%	3%	5%	4%	
		12	1	9	22
Y	5%	9%	2%	7%	
			15		15
Z	5%	7%	8%	6%	
	7		1		8
	7	12	17	9	45

Annual Finance Cost (\$ Mn)

A	7 x 5%	=	0.35
B	12 x 3%	=	0.36
C	1 x 5% + 15 x 2% + 1 x 8%	=	0.43
D	9 x 4%	=	<u>0.36</u>
			<u>1.50</u>



(b) Using the values of occupied cells dispatch (d) and reception (r) costs can be calculated as in the first table and shadow costs of the unoccupied cells as in the second table

d/r	0	1	3	2	
2		3	5	4	
-1			2		
5	5		8		

Assumed reception cost at A as zero

There could be alternative assumptions / approaches

	Alpha (A)	Beta (B)	Ceta (C)	Delta (D)
X	6% 2%	3%	5%	4%
Y	5% -1%	9% 0%	2%	7% 1%
Z	5%	7% 6%	8%	6% 7%

 Occupied cells
 Shadow costs

If the solution is optimal shadow costs of all unoccupied cells should be less than the actual cost. But in Z-D cell shadow cost is greater than the actual cost. Therefore the solution is not optimal.

- (c) Since the shadow cost is greater in Z-D than actual cost by 1%, there is a possibility of saving 1% finance cost in respect of fund allocations transferred to that cell. Such transfers are possible for present occupied cells of Z-A, Z-C or X-D. Out of these a cost reduction can be achieved only when transferred from Z-C and the amount is \$ 1 Mn

Therefore a reallocation is done as follows

Z-C to Z-D	\$ 1 Mn	cost reduction	2%
X-D to X-C (balancing)	\$ 1 Mn	cost increase	1%
		Net Saving	1%
Net cost saving	\$ 1 Mn x 1% = 0.01 Mn		
New annual Finance Cost (Minimum)	1.50 - 0.01 = 1.49 Mn		

The optimum solution will be

From Bank X - \$ 12 Mn to Project Beta; \$ 2 Mn to Project Ceta; and \$ 8 Mn to Project Delta
 From Bank Y - \$ 15 Mn to Project Ceta
 From Bank Z - \$ 7 Mn to Project Alpha; and \$ 1 Mn to Project Delta

	Alpha (A)	Beta (B)	Ceta (C)	Delta (D)	
X	6%	3%	5%	4%	
		12	2	8	22
Y	5%	9%	2%	7%	
			15		15
Z	5%	7%	8%	6%	
	7			1	8
	7	12	17	9	45

(d) The modified transportation tableau is shown below.

	Alpha (A)	Beta (B)	Ceta (C)	Delta (D)	
X	6%	3%	5%	4%	
		12	2	8	22
Y	5%	9%	2%	7%	
			12		12
Z	5%	7%	8%	6%	
	7			1	8
	7	12	14	9	42

Since there is no change in occupied cells this will be optimum. Only change is that Y-C allocation reduces from 15 to 12

Note - Re production of the tableau in not essential. **Alternatively the question could be worked out as follows:**

	\$ Mn
Current optimum solution	1.49
Cost reduction (\$ 3 Mn x 2%)	(0.06)
New Finance Cost	1.43

(e) In this case adjustment cannot be made by considering cell X-C alone since allocation in this is 2 units only. Even if allocation in this cell is cancelled and allocation in cell Y-C is also reduced to \$ 10 Mn to match the requirement of Project C, it results in imbalance in the allocated cells of banks X and Z and it becomes necessary to solve the problem fresh.

	Alpha (A)	Beta (B)	Ceta (C)	Delta (D)	
X	6%	3%	5%	4%	
		12		6	18
Y	5%	9%	2%	7%	
	2		10		12
Z	5%	7%	8%	6%	
	5			3	8
	7	12	10	9	38

Annual Finance Cost (\$ Mn)

A	$2 \times 5\% + 5 \times 5\%$	=	0.35
B	$12 \times 3\%$	=	0.36
C	$10 \times 2\%$	=	0.20
D	$6 \times 4\% + 3 \times 6\%$	=	<u>0.42</u>
			<u>1.33</u>

(6)

Answer No. 03

(a)

- (i) Expenditure variance = (Btd OH - Act OH)
= 17,980,000 – 16,500,000 = **(1,480,000) Adverse**
- (ii) Capacity variance = (Act hrs - Std hrs) std rate
= (31000 - 27500) 600 = **2,100,000 Favorable**
- (iii) Efficiency variance = (Std util. for actual output - act hrs)
= (0.5 hr*61000 - 31000) 600 = **(300,000) Adverse**

(b)

- (i) * Under traditional system all the fixed cost are treated as **fixed and absorbed to the output based on a single absorption rate** (i.e. per labour hour as per the question).
* However under ABC system fixed overhead costs are accumulated to **different activities (cost pools)** i.e. **Machinery set ups, Material handling and Labour welfare**.
* The cost of **each activity is variable on its relevant cost driver** (non-volume based) i.e. **Machinery setup cost is variable on No. of production runs, Material handling on Material orders placed and Labour welfare on labour hours**.
- (ii) * Since overheads is absorbed to the output based on the labour hours under **traditional system only one set of variance** i.e. Expenditure, Capacity and Efficiency variances can be computed.
* Under ABC system, variances i.e. expenditure and efficiency variances, **can be computed for different activities separately, generating different set of variances**.

(c)

(i)

<u>Expenditure variance</u>		
Material handling = ((3,010,000/500*510) - 3,500,000)	(429,800)	Adverse
Labour welfare = (990,000/27,500*31,000)- 1,180,000)	(64,000)	Adverse
<u>Efficiency variance</u>		
Material handling ((500/55000 * 61,000) - 510) x 3,010,000/500 =	268,164	Favorable
Labour welfare (27,500/55000*61,000) - 31,000) x 990,000/27,500 =	(18,000)	Adverse

(ii)

Expenditure variance

Expenditure variance of overhead costs arises when actual cost of activities of a cost center/pool is exceeding or falling behind the amount that is expected at that level of cost driver (activity level) of the given cost center/pool .

Interpretation : The actual amount spent for machinery set ups is Rs. **13.3 Mn for 2,110 set ups**. But the expected amount for **2,110 set ups is Rs. 13.1875 Mn** (at the standard cost per set up) resulting an **adverse variance of Rs. 112,500**.

Efficiency variance

Efficiency variance arises when the activity measure (amount of the cost driver) realised for the actual output is more or less than the expected level to achieve the same actual output level.

Interpretation : The actual output is 61,000 units. If **2,000 set ups are expected for 55,000 units, 2,218 set ups can be estimated for the actual output of 61,000 units**. However, since only **2,110 set ups actually used** there are **108 set up costs saved** (at the standard cost per set up) value of which is Rs. 676,136.

Answer No. 04

(a)

	Food Products	Estate Chemicals	Pigment & Resins
<u>Calculation of ROI</u>			
Profit before interest and tax	24.20	26.20	23.10
Add:			
Head office expenses	5.44	8.50	4.80
Controllable profit	29.64	34.70	27.90
Investment	268.00	358.00	129.00
ROI	11.06%	9.69%	21.63%
<u>Calculation of RI</u>			
Controllable profit	29.64	34.70	27.90
Less:			
Interest on Investment	(20.10)	(26.85)	(9.68)
RI	9.54	7.85	18.23

Though the Estate Chemical Division earns the highest profit and since its investment is high the ROI and RI are the lowest compared to the other division.

- (b) *
- * All three divisions do not generate same level of profit margin since they are in different industries. This may be due to the competition, other inherent costs, price controls etc.
 - * ROI does not consider
 1. The time value of money
 2. Accounting policies of the organisation
 - * Divisional performance can be influenced by many other factors beyond the control of the subject manager. Economic condition may affect the foods consumption while the consumption of estate chemicals depends on whether condition. These matters also has to be considered when evaluating divisional performance.
 - * Dysfunctional effect of ROI - A division with a 25% ROI will not accept a project with a ROI of 20%. However this project will increase overall profitability
 - * Divisional autonomy
 - * It should be also investigated whether the profit has been generated in consistent with the policies and strategies of the company. It should be ensured that the increase in ROI in the short run will not destroy the image of the company in the long run.

(c)

<u>New project - noodles plant</u>	<u>6 months</u>
Total Contribution	19.00 Mn
(-) Fixed costs	(1.70)Mn
(-) Depreciation	<u>(5.25) Mn</u>
Profit	<u>12.05 Mn</u>

<u>Investment</u>	
PPE	64.75 Mn
Net current assets	10.00 Mn
	<u>74.75 Mn</u>
ROI	16.12%
Profit	12.05 Mn
Interest on investment	<u>(5.61)Mn</u>
RI	<u>6.44</u> Mn

Alternative Method - ROI and RI after proposal is implemented

Current controllable profit	29.64 Mn
Profit from Proposal	19.00 Mn
Increase in FC	(1.70) Mn
Depreciation of new machine	<u>(5.25) Mn</u>
New Profit	<u>41.69</u> Mn
<u>New investment-</u>	
Current Investment	268.00 Mn
Less: depre of existing machine	18.33 Mn
Increase in PPE	70.00 Mn
Less: depre of new machine	(5.25) Mn
Increase in net current assets	<u>10.00 Mn</u>
New investment	<u>324.42</u> Mn
ROI	12.85%
Profit	41.69 Mn
Interest on investment	<u>(24.33) Mn</u>
RI	<u>17.36</u> Mn

ROI is higher than the present ROI

RI is positive

Therefore new project will improve the overall performance of the division

	Year 1	Year 2
Profit	38.00	38.00
Increase in FC	(3.40)	(3.40)
Depreciation	(10.50)	(10.50)
Net profit	24.10	24.10

NBV of the asset	59.50	49.00
Increase in net current assets	10.00	10.00
Total	69.50	59.00
ROI	35%	41%

The profit will remain the same. The net book value of the asset is reducing due to the depreciation. Therefore ROI improves in the second year than first year.

Answer No. 05

- (a) Attending to the repair of breakdowns is the queue system where break downs are the arrivals and repairing them is the service. Here the rate of arrival $\lambda = 3$ per hour

Slow repairman

Service rate	$\mu = 4$ per hour	@ 15 minutes
Average number of units in the system =	$\frac{\lambda}{\mu - \lambda}$	= 3
Machine hours lost per day	= 3×8	= 24
Cost of lost machine hours	= 24×160	= 3840
Cost of the repairman	= 8×80	= <u>640</u>
Total cost per day	=	= <u><u>4480</u></u>

Fast repairman

Service rate	$\mu = 6$ per hour	@ 10 minutes
Average number of units in the system =	$\frac{\lambda}{\mu - \lambda}$	= 1
Machine hours lost per day	= 1×8	= 8
Cost of lost machine hours	= 8×160	= 1280
Cost of the repairman	= 8×100	= <u>800</u>
Total cost per day	=	= <u><u>2080</u></u>

The total cost of faster repairman is lower. Therefore the faster repairman should be hired

(b) If both repairmen are hired they can repair 10 breakdowns per hour

Both repairmen

Service rate	$\mu = 10$ per hour		
Average number of units in the system =	$\frac{\lambda}{\mu - \lambda}$	=	3/7
Machine hours lost per day	=	$3/7 \times 8$	= 24/7
Cost of lost machine hours	=	$24/7 \times 160$	= 549
Cost of the repairman	=	8×180	= 1440
Total cost per day	=		= 1989

The cost is further reduced when both are hired It is therefore worthwhile to consider this option.

(d)

Time Between arrival of breakdowns	Probability	Random Numbers
10 minutes	20%	00 - 19
20 minutes	50%	20 - 69
30 minutes	30%	70 - 99

Time spent on Repairs		Probability	Random Numbers
Faster repairman	Slow repairman		
8 minutes	12 minutes	10%	00 - 09
10 minutes	15 minutes	50%	10 - 59
16 minutes	24 minutes	40%	60 - 99

Break-down	Arrival of Breakdown		Repair-man	Repair		Exit Time	Time in System	Cost @ 160/-
	RAN #	Time		RAN #	Time			
1	65	0020	Fast	80	16	0036	16	42.67
2	15	0030	Slow	65	24	0054	24	64.00
3	18	0040	Fast	85	16	0056	16	42.67
4	12	0050	Slow	40	15	0109	19	50.67
								200.00

Answer No. 06

(a) **Balance Scorecard**

- * According to the **traditional method** performance was measured only on **financial measures** i.e. profit, ROI etc.
- * Balance Scorecard concept breaks through this traditional concepts and proposes, in addition to the financial measures, three non-financial performance measurement areas for the organisations namely **Customer perspective, internal business perspective, innovation and learning perspective**

- (b) At the planning level the company make short-term objectives and strategies. BSC helps to set objectives in all four perspectives as follows;

Financial perspective

This addresses the question of how the company should **increase the shareholder value**. The company can set objectives in the following measures;

- Sales growth - eg. 40% sales increase
- Gross profit ratio - eg. 30% gross profit
- Return on Investment - 25% return on investment
- Return on capital employed
- Return on equity
- Unit cost - 20% reduction in unit cost

Customer Perspective

This perspective helps the management to look at **its customers and differentiate its offerings to achieve the above-set short term financial targets** and thereby accomplishing the vision of the company. The company can set objectives in the following measures;

- New customer acquisitions - 40% increase in customer base
- Customer retentions - 95% customer retention ratio
- Customer complaints - 1% customer complaints against sales invoices.
- Customer reject rates - Customer rejection to reduce to 1%

Internal business perspective

Once the company has set a clear picture of the financial and customer perspective, then comes is the internal business perspective where it examines **its existing infrastructures and makes necessary developments in order to achieve above set customer satisfaction and financial objectives**. The following can be used at the planning stage;

- New product introduction compared to the competitors – e.g. To introduce 4 new products for the next year.
- Percentage of sales from new products – e.g. 20% of total sales to be from new products.
- Time consumed for developing new products
- Reduction in production losses- e.g. 2% reduction in loss
- Improvement in productivity - 1% increase in productivity
- Reducing process cost
- Response time to customer complaints
- Cost of staff for customer complaint handling

The learning and growth perspective

This allows to understand the company the current level of its resources and expected level in order to excel to achieve the desired internal processes, customer relationship and financial goals set above. The company can **evaluate the employees, information technology and other infrastructure within the organisation and should take steps to fill the gaps to achieved desired levels.** The following are some of measures in this category

- Employee skill level
- Training availability - % of staff members trained, training hours
- Employee satisfaction -
- Job retention - bring the employee turnover to 0.5%

(c)

- * Provides a powerful framework for developing and **communicating strategies.**
- * The entire outcomes and strategies are known in advance and communicated to all the parties. This will enable to execute the **strategies more efficient manner.**
- * This provides a valuable information to the management. It allows **management to measure the actual outcome and correct the differences for future periods.**
- * This provides improved **performance reporting** under different responsibility levels and company as a whole
- * This will enable the company to align its **resources with the strategic objectives**
- * This will enable the company to create a **strategy focused environment.**

(d) Benchmarking is;

Benchmarking is the continuous **search** for and **adaptation** of **significant better practices** that **leads to superior performance** by investigating the **performance and the practices of other organizations such as market leading competitor, company in a different industry etc.**

These best practices of the benchmarked companies can be adopted in Proflink and thereby it can bring the performance level to industry standard level.

- (e) The performance in customers' perspective measures can be improved by adopting the best customer oriented practices of benchmarked organisations.

For Example

- * The market leader's customer complaints handling procedure can be used for the company.
- * Aftersales procedure of the company could be made according to the best system in the industry.
- * Invoicing and product delivery systems can be designed according to the best system in the industry.

By doing so, it can be able to improve the performance in customers' perspective measures.

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