CMA December-2020 Examination
Subject: 402. Strategic Management Accounting
Professional Level-IV

Model Solution

Solution of the Q. No. 1(a)

(a) (i) advantages of NIVA's low-cost strategy:

- "Low cost" is a highly effective strategy when (as in this case) buyers are very price-sensitive.
- "Low cost" is highly effective when it is not obviously possible or desirable to achieve credible production differentiation. It is in the nature of many of these products that retail buyers expect them to "just work as they should"; apart from avoiding sub-par products buyers are likely to regard most products of any one type as largely generic and therefore price is likely to be the deciding factor in any purchase decision.
- Where (as in this case) the market consists of large and powerful buyers, "high cost" manufacturers cannot survive profitably, given the low prices these buyers will pay. The only way for a manufacturer to earn adequate profit is to keep its own costs low.

Disadvantages of neva's low-cost strategy:

- "Low cost" is a difficult position to maintain over time. In any industry only one firm can be the cheapest, so it is necessary to consistently identify any cost savings which competitors may be achieving.
- Technological or market changes can make a cost leadership strategy ineffective. For example increased availability of cloud storage and falling charges for data services from internet service providers may mean that buyers are less concerned with the internal storage capacity of their mobile computing devices and are therefore less interested in SD cards or OTG adapters.

Solution of the Q. No. 1(b)

Note that the first part of the question is a forecasting question so it is solved below.

For product 1 applying exponential smoothing with a smoothing constant of 0.7 we get:

$M_1 = Y_1 = 23$
$M_2 = 0.7Y_2 + 0.3M_1 = 0.7(27) + 0.3(23) = 25.80$
$M_3 = 0.7Y_3 + 0.3M_2 = 0.7(34) + 0.3(25.80) = 31.54$
$M_4 = 0.7Y_4 + 0.3M_3 = 0.7(40) + 0.3(31.54) = 37.46$

The forecast for week five is just the average for week 4 = M_4 = 37.46 = 37 (as we cannot have fractional demand).

For product 2 applying exponential smoothing with a smoothing constant of 0.7 we get:
$M_1 = Y_1 = 11$
$M_2 = 0.7Y_2 + 0.3M_1 = 0.7(13) + 0.3(11) = 12.40$
$M_3 = 0.7Y_3 + 0.3M_2 = 0.7(15) + 0.3(12.40) = 14.22$
$M_4 = 0.7Y_4 + 0.3M_3 = 0.7(14) + 0.3(14.22) = 14.07$

The forecast for week five is just the average for week 4 = M_4 = 14.07 = 14 (as we cannot have fractional demand).
We can now formulate the LP for week 5 using the two demand figures (37 for product 1 and 14 for product 2) derived above.
Let

x_1 be the number of units of product 1 produced

x_2 be the number of units of product 2 produced

where $x_1, x_2 >= 0$

The constraints are:

$15x_1 + 7x_2 <= 20(60)$ machine X

$25x_1 + 45x_2 <= 15(60)$ machine Y

$x_1 <= 37$ demand for product 1

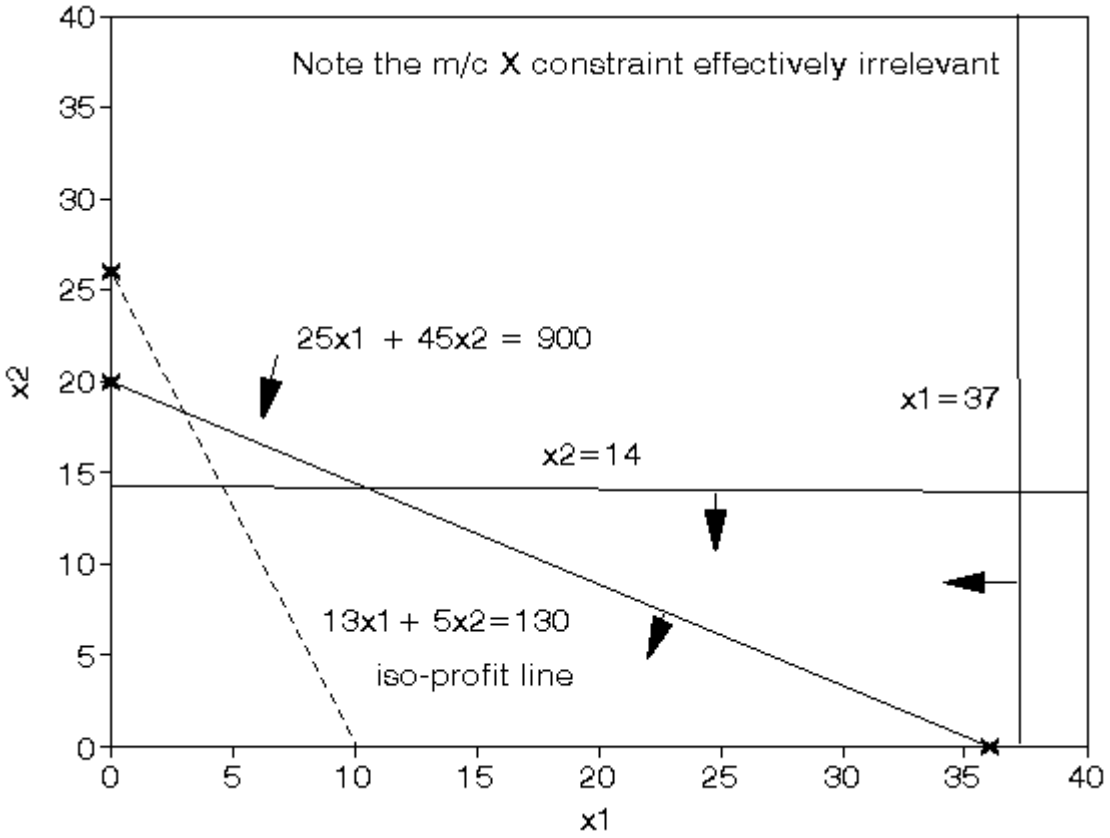
$x_2 <= 14$ demand for product 2

The objective is to maximise profit, i.e.

maximise $10x_1 + 4x_2 - 3(37- x_1) - 1(14-x_2)$

i.e. maximise $13x_1 + 5x_2 - 125$

(b) The graph is shown below, from the graph we have that the solution occurs on the horizontal axis (x_2=0) at x_1=36 at which point the maximum profit is 13(36) + 5(0) - 125 = TK343



Solution of the Q. No. 2(b)

1.

	Super-chip	**Okay-chip**
Selling price	$80	$26
Direct material cost per unit	$ 5	$ 2
Direct manufacturing labor cost per unit	$60	$20
Contribution margin per unit	$15	$ 4
Contribution margin per hour ($15 /3; $4 /1)	$5	$ 4

Because the contribution margin per hour is higher for Super-chip than for Okay-chip, CIC should produce and sell as many Super-chips as it can and use any remaining available capacity to produce Okay-chip.

The total demand for Super-chips is 15,000 units, which would take the entire capacity of 45,000 hours (15,000 * 3 hours per unit). Therefore, CIC should manufacture only Super-chips. Annual contribution margin would be $225,000 ($15 per unit × 15,000 units).

2. Options for manufacturing process-control unit:

	Using Circuit Board	Using Super-chip
Selling price	$132	$145
Direct material cost per unit	70	5
Direct manufacturing labor cost per unit (Super-chip)	0	60
Direct manufacturing labor cost per unit (process-control unit)	45	45
Contribution margin per unit	$ 17	$ 35

Overall Company Viewpoint	
Alternative 1: No Transfer of Super-chips:	
Sell 15,000 Super-chips at contribution margin per unit of $15	$225,000
Sell 5,000 Control units at contribution margin per unit of $17	85,000
Total contribution margin	$310,000
Alternative 2: Transfer 5,000 Super-chips to Process-Control Division:	
Sell 10,000 Super-chips at contribution margin per unit of $15	$150,000
Sell 5,000 Control units at contribution margin per unit of $35	175,000
Total contribution margin	$325,000

CIC is better off transferring 5,000 Super-chips to the Process-Control Division.

3. The Semiconductor Division manager would not accept a transfer price below the market price of $80 per unit because the division has willing outside buyers at that price. Any lower price would reduce the division's operating income. The Process-control Division manager would not pay more than $83 per unit ($70 currently paid for the circuit board, plus the $13 increase in selling price due to using the Super-chip). Therefore, any transfer price between $80 and $83 would ensure goal congruence.
4. If 15,000 additional labor hours were available in the Semiconductor Division, those hours could be used to manufacture 15,000 Okay-chips (at 1 labor hour per chip), or be used to manufacture 5,000 Super-chips (at 3 labor hours per chip) for transfer to the Process-control Division. The Semiconductor Division manager would require a transfer price at least equal to the opportunity cost of the lost sales of Okay-chips. Because the Semiconductor Division could manufacture and sell three Okay-chips at $26 each for every one Super-chip transferred, the minimum required transfer price would be $78 (3 × $26). The maximum price would remain at $83.

Solution of the Q. No. 3(a)

The Customer Experience Manager (CEM) should respond to the Executive Committee (EC) with the following information:

- The role of the EC is to provide support to the teams involved in the companywide process improvement initiative. At this point, the EC has agreed to the proposal presented and is willing to reassign staff. However, the EC must provide the necessary time and money to effectively implement the initiatives.
- Some of the obstacles that may take place are: an initiative is too costly; an initiative does not really meet the needs of the customer; poor mix of membership on a cross-functional team; incorrect measurement of implementation progress; and lack of management support.
- The methods to overcome such obstacles are: to do a cost benefit analysis prior to implementation; seek customer feedback on proposed initiatives; make sure cross-functional teams have good representation; choose correct tools to measure the initiative (one tool may be a poor choice for all initiatives proposed); encourage management support throughout the whole process. At times management may need to approve additional staffing, give or gain permission for some things to be done.
- The quality manager's role is to be a leader and help coordinate the implementation of the initiatives by facilitating teams; Reporting to the EC periodically and to keep up with the measurement of the process.

<u>The role of EC is</u>

1. To encourage all managers to participate in this case.
2. Attend the review meeting and give recommendation.
3. Provide full support and recognition.

The role of Customer Experience Manager:

1. Organize the improvement team
2. Provide training
3. Coordinate the team activities
4. Record all data of the improvement activities

Solution of the Q. No. 3(b)

I) NPV

	Years					
	0	**1**	**2**	**3**	**4**	**5**
Revenue		1,600	1,920	2,304	2,765	3,318
Expenditure		1,000	1,150	1,323	1,521	1,749
CF before tax		600	770	982	1,244	1,569
Tax 32.5%		195	250	319	404	510
CF ater tax		405	520	663	840	1,059
WC	-100	110	121	133	146	161
Initial investment	-1500	295	399	529	693	898
PV factor (weighted average cost of capital) 10%		0.9090	0.8260	0.7510	0.6830	0.6210
PV of Cash flows		268	329	398	473	558
Cumulative Cash flow	-1600	(1,332)	(1,002)	(605)	(131)	426

NPV =BDT 426 mln

ii) Payback period (4+ 131/558) 4.24 yrs

iii) Calculate IRR considering @ above WACC and 20% cost of capital

	Years					
	0	**1**	**2**	**3**	**4**	**,5**
Revenue		1,600	1,920	2,304	2,765	3,318
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Initial investment	-1500	295	399	529	693	898

PV factor (weighted average cost of capital) 10%		0.9090	0.8260	0.7510	0.6830	0.6210	
PV of Cash flows		268	329	398	473	558	2,026
Cumulative Cash flow	-1600	(1,332)	(1,002)	(605)	(131)	426	

PV factor (weighted average cost of capital) 20%		0.833	0.694	0.579	0.482	0.401	
		245.74	276.73	306.53	334.14	360.04	1,523
	-1600	(1,354.27)	(1,077.53)	(771.00)	(436.86)	(76.82)	

IRR=(20-0.15)% 19.85%

iv) PI : PV of Net inflows/Initial Investment = 2026/1600 1.26625

As the value of the PI is more than 1 then the project is attractive.

Solution of the Q. No. 4(b)

(i) The first-stage allocation is shown below:

	Volume related	Order related	Customer Support	Other	Totals
Wages and salaries	Tk. 120000	Tk. 90000	Tk. 60000	Tk. 30000	Tk. 300000
Other overhead costs	30000	10000	20000	40000	100000
Total overhead cost	Tk. 150000	Tk. 100000	Tk. 80,000	Tk. 70000	Tk. 400000

According to the distribution of resources across activities, 40% of the Tk. 300,000 wages and salaries cost is attributable to volume related activities.

Tk. 300, 000 x 40% = Tk. 120,000

(ii) The activity rates are computed by dividing the costs in the cells of the first-stage allocation above by the total activity from the top of the column.

	Volume Related	Order Related	Customer Support
Total activity	20,000 DLHs	400 orders	200 customers
Wages and salaries	Tk. 6.00	Tk. 225.00	Tk. 300.00
Other overhead costs	1.50	25.00	100.00
Total cost	Tk. 7.50	Tk. 250.00	Tk. 400.00

Example: Tk. 120,000 / 20,000 DLHs = Tk. 6.00 per DLH
Volume related wages and salaries from the first-stage allocation above

(iii) The overhead cost for the order is computed as follows:

	Volume Related	Order Related	Customer Support	Total
Activity	20 DLHs	1 order	Not applicable	
Wages and salaries.....	Tk. 120.00	Tk. 225.00	Tk. 0.00	Tk. 345.00
Other overhead costs.....	30.00	25.00	0.00	55.00
Total cost	Tk. 150.00	Tk. 250.00	Tk. 0.00	Tk. 400.00
	=======	========	======	========

Example: 20 DLHs x Tk. 6.00 per DLH= Tk. 120.00
Activity rate for volume related wages and salaries from part (ii) above.

(iv) The activity view report can be constructed using the column totals a t the bottom of the overhead cost analysis in part (3) above.

Sales (10 units @ Tk. 300 per unit)		Tk. 3000
Costs:		
Direct materials (10 units @ Tk. 180 per unit)	Tk. 1800	
Direct labor (10 units @ Tk. 50 per unit)	500	
Volume related overhead.....	150	
Order related overhead	250	
Product Margin.....		2700
		Tk. 300

The customer margin is computed as follows:

Product margin (above)	Tk. 300
Less: Customer support overhead (1 customer @ Tk. 400 per customer	Tk. 400
Customer margin.....	Tk (100)

Solution of the Q. No. 5(a)

Environmental cost	$	$	% of total environmental cost
Prevention cost:			
Operating cost of waste reprocessing	31,400		
Repairs to faulty waste management equipment	30,000		
Cost of retraining employees in new waste management processing	1,800		
Cost of achieve ISO 14001 certification	68,600		
Cost of protective clothing for employees	32,400		
Total prevention cost		168,200	42.85%
Appraisal cost:			
Cost of independent environmental audit	47400		
Total Appraisal cost		47400	12.37%
Internal failure cost:			
Cost of disposing of chemicals in landfill	69,800		
Cost of processing chemicals ready for landfill	56,000		
Total internal failure cost		125800	32.83%
External failure cost:			
Legal fees related to chemical spill during transport to landfill	45800		
Total external failure cost		45800	11.95%
Total environmental costs		**383200**	**100%**

Solution of the Q. No. 5(b)

1. Bleefl would be better off if the machine is replaced. Its cost of capital is 6% and the IRR of the investment is 11%, indicating that this is a positive net present value project.
2. The ROIs for the first five years are:

Year	1	2	3	4	5
Operating income*	$2,000	$2,000	$2,000	$2,000	$2,000
End of year net assets	27,000	24,000	21,000	18,000	15,000
Average net assets#	28,500	25,500	22,500	19,500	16,500
ROI	7.02%	7.84%	8.89%	10.26%	12.12%

*Income is cash savings of $5,000 less $3,000

Annual depreciation expense. ($30,000 + $27,000) ÷ 2 = $28,500

The manager would not want to replace the machine before retiring because the division is currently earning a ROI of 11%, and replacement of the machine will lower the ROI every year until the fifth year, when the manager is long gone.

3. Bleefl could use long term rather than short term ROI, or use ROI and some other long-term measures to evaluate the Patio Furniture division to create goal congruence. Evaluating the managers on residual income rather than ROI would also achieve goal congruence. For example, replacing the machine increases residual income in Year 1. Residual income = Operating income − (6% × Average net assets) = $2,000 − (6% × 28,500) = $2,000 − $1,710 = $290.

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