

SUGGESTED SOLUTIONS

CL3 - Advanced Management Accounting

February 2021

SECTION 1

Answer 01

1.1

Learning outcome/s: 1.1.2
Study text reference: Pages 8 – 12
Correct answer: D

1.2

Learning outcome/s: 1.1.4

Study text reference: Pages 33 - 39

Correct answer: C

Throughput contribution = Rs. 2,500 - Rs. 1,400 = Rs. 1,100

Throughput contribution per machine hour = Rs. 1,100/0.05 = Rs. 22,000

Total conversion cost = (Rs. 250 * 1,500) + Rs. 3,000,000 = Rs. 3,375,000

Conversion cost per hour = Rs. 3,375,000/600 = Rs. 5,625

Throughput accounting ratio = Throughput contribution per hour / Total conversion cost per

110UI D- 22 000 / D- E

= Rs. 22,000 / Rs. 5,625

= Rs. 3.91

1.3

Learning outcome/s: 1.1.5

Study text reference: Pages 46 and 47

Correct answer: B

1.4

Learning outcome/s: 1.3.1 Study text reference: Page 96

Correct answer: C

- (i) Relates to target costing
- (ii) Relates to Kaizen costing
- (iii) Relates to target costing

1.5

Learning outcome/s: 1.4.1

Study text reference: Pages 118 - 127

Correct answer: A

Learning outcome/s: 2.1.1

Study text reference: Pages 152 - 155

Correct answer: B

Standard time = 2,000/50 = 40 hours Standard rate = 600,000/2,000 = Rs. 300 Actual hours = 900,000/400 = 2,250 hours

Labour efficiency variance

55 batches should have taken (55 * 40)

But did take (2,250 – 120)

Efficiency variance in hours

2,200 hours

2,130 hours

70 Favourable

Standard rate per hour Rs. 300

Labour efficiency variance (70 * 300) Rs. 21,000 Favorable

1.7

Learning outcome/s: 2.1.6

Study text reference: Page 200

Correct answer: D

Only (ii) is not correct. The marginal costing system will only have a FOH expenditure variance.

1.8

Learning outcome/s: 2.2.1

Study text reference: Page 214

Correct answer: D

DC >= EC >= BC > 68,000 units

Learning outcome/s: 4.3.2

Study text reference: Page 485

Correct answer: C

Per the details given the frequency is high in this transaction as there will be monthly payments for 3 years. However, the severity is expected to be low as large companies have structured vendor evaluation processes in place and often only a few vendors in the market may benchmark each other. "Reduce and Control" is more relevant in the TARA model. Further, this may create a conflict of interest on the purchasing manager. It is important to note that only a few qualified suppliers are available in the market. Hence, quality is much more important. When the relationship is disclosed, the company can go ahead with mitigating controls.

1.10

Learning outcome/s: 5.1.3

Study text reference: Pages 511 and 512

Correct answer: A

(Total: 20 marks)

SECTION 2

Question 02

Learning outcome/s: 1.2.1

Study text reference: Pages 61 - 66

(a)

			Rs. '000
	Chemical P	Chemical Q	Chemical R
Sales	36,000	44,000	15,000
Costs			
- Material cost	6,600	5,600	3,840
- Direct labour	5,100	4,400	2,200
- Overheads (W1)	13,000	16,200	12,280
Total product cost	24,700	26,200	18,320
Profit from each product based on ABC	11,300	17,800	(3,320)

Based on ABC, Chemical R generates a loss for the company. Therefore, by discontinuing Chemical R the company could save Rs. 3.32 million next year.

W1: Overhead allocation based on ABC

	Chemical P	Chemical Q	Chemical R	Total
Machine time (hours) per kg	0.10	0.30	0.12	
Production quantity (kg)	60,000	40,000	20,000	
Total machine time (hours)	6,000	12,000	2,400	20,400
Machine operating cost (Rs. '000)	4,200	8,400	1,680	14,280
No. of supplier orders	80	20	160	260
Material ordering cost (Rs. '000)	3,200	800	6,400	10,400
No. of production runs	80	100	60	240
Set-up cost (Rs. '000)	5,600	7,000	4,200	16,800
Total overheads (Rs. '000)	13,000	16,200	12,280	41,480

(5 marks)

	Chemical P	Chemical Q
Sales (Rs. '000)	36,000	44,000
Sales quantity	60,000	40,000
Selling price per kg (Rs.)	600	1,100
Cost based on ABC (Rs.)	24,700	26,200
Cost per kg based on ABC (Rs.)	411.67	655.00
Contribution (Rs.)	188.33	445.00
Machine time (hours) per kg	0.10	0.30
Contribution per hour (Rs.)	1,883.33	1,483.33
Ranking	No. 1	No. 2
Total available hours		20,400
Chemical P: 60,000 * 0.10		(6,000)
Chemical Q: 40,000 * 0.30		(12,000)
Balance available		2,400
Based on the ranking	Addition	al output
Chemical P	15,000	(1,500)
Chemical Q	3,000	(900)

(5 marks)

(Total: 10 marks)

Question 03

Learning outcome/s: 2.3.1 and 2.3.5 Study text reference: Pages 232, 248 – 252

(a)

Budgetary control statement

				Rs. '000
Item	Budget	Flexed budget	Actual	Variance
Sales revenue (W1)	6,000	7,200	6,900	300 Adv
Cost of sales	0,000	7,200	0,700	Soonav
- Materials (W2)	(2,500)	(3,000)	(2,850)	150 Fav
- Direct labour (W3)	<u>(500)</u>	(600)	(660)	60 Adv
Gross profit	3,000	3,600	3,390	210 Adv
Selling and administrative	(1,600)	(1,840)	(1,900)	60 Adv
expenses (W4)				
Depreciation	(150)	(150)	(100)	50 Fav
Net profit	<u>1,250</u>	<u>1,610</u>	<u>1,390</u>	220 Adv

(5 marks)

Workings

W1

Actual quantity sold = (6,000,000 + 900,000)/11,500 = 600 units Flexed sales = 600 * 12,000 = Rs. 7,200,000

W2: Materials

Budgeted sales = 6,000,000/12,000 = 500 units Material rate = 2,500,000/500 = Rs. 5,000 Flexed materials = 5,000 * 600 = Rs. 3,000,000 Actual materials = 2,500,000 + 350,000 = Rs. 2,850,000

W3: Direct labour

Labour VC = 500,000 - [(500/100) * 10,000] = 450,000 VC per item = 450,000/500 = Rs. 900 Flexed direct labour = 900 * 600 + (10,000 * 6) = Rs. 600,000 Actual direct labour = 500,000 + 160,000 = Rs. 660,000

W4: Selling and administrative expenses

VC = 1,600,000 * 0.75 = Rs. 1,200,000FC = Rs. 400,000VC per unit = 12,00,000/500 = Rs. 2,400Flexed selling and administrative expenses = (600 * 2,400) + 400,000 = Rs. 1,840,000Actual selling and administrative expenses = 1,600,000 + 300,000 = Rs. 1,900,000

(b) Advantages of the adaptive management process

- The adaptive management process results in performance targets based on competitive success. Goals are agreed via reference to external benchmarks as opposed to internally negotiated fixed targets.
- It motivates people by giving them challenges, responsibilities and clear values as guidelines. Rewards are team-based.
- It develops performance responsibilities for operational management who are closer to the external situation, which leads to a more rapid response to changing market needs
- The measures used are more flexible (key ratios rather than detailed line-by-line budgets).
- It assists in developing a customer orientation, faster response times and greater innovation.
- It creates a transparent and open information system throughout the organisation, which should provide fast and open information to facilitate control at all levels.

Disadvantages of the adaptive management process

- It may appear directionless, which may concern investors or shareholders.
- Performance-based rewards could become subjective.
- Cash flow and funding forecasts may become difficult without budgets.

(3 marks)

(c) Principles to be followed when implementing the adaptive management process

- The responsibilities of managers within the organisation should be clearly defined.
- Managers should be given goals and targets that are based on key performance indicators (KPIs) and benchmarks. Targets should be linked to shareholder value.
- Managers should be given freedom to make decisions (adapting a flat organisation chart).
- Responsibility for decisions that generate value should be placed with frontline teams.
- Frontline teams should be made responsible for relationships with customers, associate businesses and suppliers.
- Information support systems should be transparent and aligned with the activities that managers are responsible for.

(2 marks)

(Total: 10 marks)

Question 04

Learning outcome/s: 2.5

Study text reference: Pages 275 – 288

(a)

	Rs.
Selling price	150,000
Variable cost	(135,000)
Contribution	<u>15,000</u>
No. of units = 1,000	
Total contribution	15,000,000
Fixed costs	(12,000,000)
Profit per month	3,000,000

(1 mark)

(b)

			Rs.
	LM division	IM division	Company
Motor sales	45,000,000	-	-
Rammer sales		150,000,000	150,000,000
Variable cost (motors)	(30,000,000)	-	(30,000,000)
Variable cost (rammers without motors)	-	(85,000,000)	(85,000,000)
Variable cost (sale of motors)	_	(45,000,000)	-
Fixed costs	(5,000,000)	(12,000,000)	(17,000,000)
Profitability	10,000,000	8,000,000	<u> 18,000,000</u>

(4 marks)

(c) (i)

			Rs.
	LM division	IM division	Company
Motor sales	54,000,000	-	1
Rammer sales	-	174,000,000	174,000,000
Variable cost (motors)	(36,000,000)	-	(36,000,000)
Variable cost (rammers without motors)	-	(102,000,000)	(102,000,000)
Variable cost (sale of motors)	-	(54,000,000)	-
Fixed costs	(5,000,000)	(12,000,000)	(17,000,000)
Profitability	13,000,000	6,000,000	19,000,000

(c) (ii)

Since the profit of the LM division increases due to the price change in rammers, it will definitely accept the additional manufacturing of motors for the rammers.

However, the IM division's profit will come down by Rs. 2 million (compared to the previous state), and therefore the management will hesitate to accept the price reduction.

However, since the overall profitability of the company increases by Rs. 1 million the proposal to reduce the price should be accepted. The top management should come up with a proposal to change the transfer pricing policy.

(5 marks)

(Total: 10 marks)

Question 05

Learning outcome/s: 5.1.3 Study text reference: Pages 505 – 508, 511

(a)

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Debtors' turnover period = (Average debtors / Average sales) * 365

= (3.4/20) * 365

= 62 days

Cost of sales = 20 * (1 - 20%)

= Rs. 16 million

Inventory turnover period = (Average inventory / Cost of sales) * 365

= (3.2/16) * 365

= 73 days

Creditors' turnover period = (Average creditors / Cost of sales) * 365

= (1.40/16) * 365

= 32 days

Cash operating cycle = Inventory days + Debtors' days - Creditors' days

= 62 + 73 - 32

= 103 days
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(3 marks)

(b)

- The creditors' turnover period is significantly low (32 days) when compared to the industry average of 40 days. This indicates that the company is settling creditors early when the competitors obtain longer credit periods. The very high inventory turnover period of 73 days when compared to the industry average of 45 days indicates that the company is trying to stock more inventory than industry practice.
- The debtors' turnover period is 62 days although the industry average is 30 days. This indicates that the company is trying to increase its revenue by giving a greater credit period to buyers. When the industry collects money from debtors early, NPL has to wait for another one month to recover money. Hence the company will have to rely on loans.
- When the industry has reported a 15% year-on-year sales growth, NPL has reported a 40% sales growth for the year. However, NPL's yearly gross profit has reduced by 5% when compared to last year's performance. This indicates that the company is aggressively working on increasing its sales targets without trying to maintain gross profitability.
- NPL's cash operating cycle is 103 days. This indicates that the company has to wait for 103 days from the creditor settling date to realise cash from sales. The period is 68 days longer than industry practice. Due to this, the company will face a liquidity problem if the cash operating cycle is not managed.

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Industry cash operating cycle = (45 + 30 - 40) = 35 days NPL and industry gap = 103 - 35 = 68 days
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• NPL's low current ratio (1.40 times) and quick ratio (0.72 times) indicate a potential liquidity issue, which is further verified by the short-term loan facility reaching its full limit. Due to this, the company may have to find other funding sources to handle the working capital requirements of the business.

Current ratio = Current assets/Current liabilities
=
$$(3.40 + 3.2)/(1.4 + 3.3) = 1.40$$
 times
Quick ratio = $3.40/(1.4 + 3.3) = 0.72$ times

The above analysis indicates that the company is in an **overtrading** trap. It is trying to do too much too quickly. Even though the company earns profits and has shown higher sales growth compared to the industry sales growth, it could potentially run into serious problems due to running short of money.

(4 marks)

(c) Recommendations to overcome the overtrading problem

- Try to get more new capital inflows from the owners.
- Inventory controls reduce the stock holding period and improve the stock turnover period. Ideally the company should benchmark with the industry average.
- Relook at the company's aggressive sales growth targets. Sales growth should be achieved by having the optimum standards for the debtor collection period, gross profit ratio and inventory holding days.
- Negotiate with the creditors for better credit terms. Deferring creditor payments for a longer period can help better management of the liquidity status of the company.
- Continuous monitoring of the utilisation of the short-term loan facility to maintain it within the limit. Alternative financing facilities should be looked at to prepare for future liquidity issues.
- Look for options to have long-term loan facilities instead of short-term loans.

(3 marks)

(Total: 10 marks)

SECTION 3

Question 06

Learning outcome/s: 3.3.1, 3.3.2 and 4.2.1 Study text reference: Pages 400 – 412, 475

(a)

							Rs. '000
		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
(1)	Capital expenditure	(60,000)	-	-	-	-	-
(2)	Residual value (10% * Rs. 60 million)	-	-	-	-	-	6,000
(3)	Opportunity cost - rental income	-	(6,000)	(6,600)	(7,260)	(7,986)	(8,785)
(4)	Sales (W1)	-	100,000	168,000	288,000	225,000	104,000
(5)	Variable cost (W2)	_	(80,600)	(134,118)	(209,225)	(163,195)	(75,432)
(6)	Fixed overheads (with 5% inflation)	-	(10,500)	(11,025)	(11,576)	(12,155)	(12,763)
(7)	Tax (liability)/savings (W3)	_	2,548	(1,192)	(13,423)	(8,306)	(286)
	Net cash flow	(60,000)	5,448	15,065	46,516	33,358	12,734
	Discount rate (Note A)	1	0.866	0.750	0.649	0.562	0.487
	Present value (PV)	(60,000)	4,718	11,299	30,189	18,747	6,201
	Net present value (NPV)	11,154					

Since the NPV is positive, production of the new product at the existing facility could be recommended.

					Rs. '000
W1: Sales	Year 1	Year 2	Year 3	Year 4	Year 5
Sales volume	50,000	80,000	120,000	90,000	40,000
Selling price (Rs.)	2,000	2,100	2,400	2,500	2,600
Sales income (Rs.)	100,000	168,000	288,000	225,000	104,000
W2: Variable cost	Year 1	Year 2	Year 3	Year 4	Year 5
Variable cost per unit (with inflation) (Rs.)	1,612	1,676	1,744	1,813	1,886
Sales volume	50,000	80,000	120,000	90,000	40,000
Total variable cost (Rs.)	80,600	134,118	209,225	163,195	75,432

Expected variable cost = 1,700 * 35% + 1,500 * 45% + 1,400 * 20% = Rs. 1,550

					Rs. '000
W3: Tax (liability)/savings	Year 1	Year 2	Year 3	Year 4	Year 5
Operating profit $[(3) + (4) + (5) + (6)$ of the above	2,900	16,257	59,939	41,664	7,020
Residual value of investment	-	-	-	-	6,000
Depreciation allowance (20%)	(12,000)	(12,000)	(12,000)	(12,000)	(12,000)
Tax applicable profit/(loss)	(9,100)	4,257	47,939	29,664	1,020
Tax (liability)/savings at 28%	2,548	(1,192)	(13,423)	(8,306)	(286)

 ${\it Candidates\ should\ consider\ tax\ savings\ for\ the\ same\ period\ since\ OPL\ has\ other\ taxable\ profits\ to\ offset.}$

(13 marks)

(b) Computation of IRR

						Rs. '000
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Net cash flow	(60,000)	5,448	15,065	46,516	33,358	12,734
Discount rate (22%)	1.000	0.820	0.672	0.551	0.451	0.370
PV	(60,000)	4,467	10,124	25,630	15,044	4,712
NPV	(23)					
IRR						
= 15.5% + (6.5%/(11,154 + 23)) *						
11,154	21.99%					

In case the cost of capital increases for some reason (may be due to an increase in the borrowing rate, an increase in the required return from shareholders, or an increase in COC due to a change in the capital structure) the discount rate of 15.5% will no longer be valid. If the required rate goes beyond 21.99%, this project will no longer be a viable project from a financial point of view.

Unforeseen and adverse circumstances could result in a decline in revenue or an increase in costs, or both. In such a scenario to absorb such shocks there is a safety margin of 6.49% in terms of IRR.

(4 marks)

(c)

- Since OPL has made all project-related estimations prior to the COVID-19 outbreak, the cash flow estimates given cannot be relied upon. Hence to gauge the true picture of the financial acceptability of the project, it is essential to relook at the cash flow estimates. For instance, the reliability of the sales volume estimates is questionable due to the pandemic, and the company will have to relook at the accuracy of the numbers provided. With the current condition the sales volume will not be achievable and therefore the sale quantities should be re-evaluated.
- Due to the pandemic, the imports to the country were restricted. OPL is planning to import some machinery and equipment, and the raw materials required are also to be imported from Middle Eastern countries. As there is a restriction on imports, it is imperative to check whether the company will be permitted to import the necessary machinery, equipment, and raw materials. If not, this will have an impact on the entire project.
- Interest rates also have drastically come down, and this could have an impact on the nominal weighted average cost of capital, which is used to discount the project cash flows.
- Check the reliability of the probabilities provided as the cost of materials is highly dependent on the economic conditions in the supplying countries.
- The estimated inflationary factor may not be realistic in the current conditions. The production of some products within the country has virtually been on a standstill, while the prices of imported items are increasing at a higher rate due to various restrictions and the impact of exchange rate fluctuations.

(3 marks)

(Total: 20 marks)

Question 07

Learning outcome/s: 3.1.1, 3.1.2, 3.2.1 and 3.1.3 Study text reference: Pages 343, 361, 362, 386, 323 – 330

(a)

Contribution per liter

Skim milk = 125 - 105 = Rs. 20Cream = 750 - 530 = Rs. 220

Contribution per mix = (20 * 4) + 220 = Rs. 300

Break-even number of mixes = 1,650,000/300 = 5,500 mixes Break-even revenue = (5,500 * 4 * 125) + (5,500 * 1 * 750)= Rs. 6,875,000

Sales mixes at full capacity = 40,000/5 = 8,000 mixes Sales = (8,000 * 4 * 125) + (8,000 * 1 * 750)

= Rs. 10,000,000

Margin of safety = 10,000,000 - 6,875,000 =**Rs.** 3,125,000

As a % of sales = 3,125,000/10,000,000 = **31.25%**

(3 marks)

(b)

The variables will be defined as follows:

Butter = X

Whipping spread = Y

Objective function for profit maximisation

Total cost of butter = (80 * 750) + (4 * 500) + 3,000 = Rs. 65,000Contribution per item = 80,000 - 65,000 = Rs. 15,000

Total cost of whipping spread = (20 * 750) + (2 * 500) + 4,000 = Rs. 20,000Contribution per item = 25,000 - 20,000 = Rs. 5,000

Hence, the objective is to maximise,

C = 15,000X + 5,000Y

Constraints to achieve the objectives

- 1. Material supply maximum of 8,000 liters $80X + 20Y \le 8,000$
- 2. Mixing plant hours, maximum of 300 hours $2X + Y \le 300$
- 3. Packing plant hours, maximum of 180 hours $1.5X + 0.5Y \le 180$
- 4. Maximum demand for whipping spread is 260 packs $Y \le 260$
- 5. Non negativity $X, Y \ge 0$

Amounts for graph:

1.
$$80X + 20Y = 8,000$$

$$X = 100$$

$$Y = 400$$

2.
$$2X + Y = 300$$

$$X = 150$$

$$Y = 300$$

3.
$$1.5X + 0.5Y = 180$$

$$X = 120$$

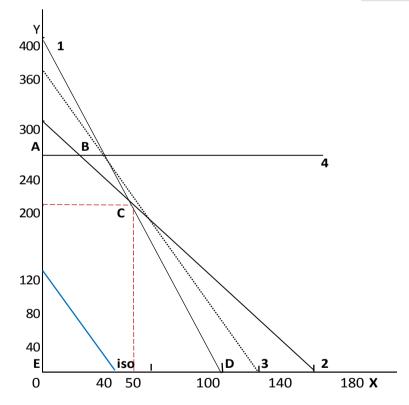
$$Y = 360$$

4.
$$Y = 260$$

5. Iso line to maximise
$$C = 15,000X + 5,000Y$$

$$15,000X + 5,000Y = 600,000$$

The graph is as follows.



The best solution is on the edge of the feasible area, on Point C.

Optimum production units

$$X = 50$$
 packs

Contribution = 50 * 15,000 + 200 * 5,000 = Rs. 1,750,000

(c)

Slack variables – this occurs if the maximum availability of resources is not binding at the optimum solution.

Cream output of 8,000 units

$$8,000 = (80 * 50) + (20 * 200)$$

= 0 binding

If the material supply is increased by 1 litre, the simultaneous equations would be:

$$80X + 20Y = 8,001 \rightarrow 1$$

2X + Y = 300 \rightarrow 2

When Equation 2 is multiplied by 40, $80X + 40Y = 12,000 \rightarrow 3$

Then, Equation 3 minus Equation 1 would be: 20Y = 3,999

Y = 199.95 and X = 50.025

When the above values are substituted to the objective function,

$$C = 15,000X + 5,000Y$$

= 1.750.125

Therefore, the shadow price for one litre of material supply would be:

= Rs. 125

Mixing plant hours

If mixing plant hours is increased by 1 hour the simultaneous equations would be:

$$80X + 20Y = 8,000 \rightarrow 1$$

2X + Y = 301 \rightarrow 2

When Equation 2 is multiplied by 40, $80X + 40Y = 12,040 \rightarrow 3$

Then, Equation 3 minus Equation 1 would be:

$$20Y = 4,040$$

$$Y = 202$$

If Y = 202, X would be 49.5

When the above values are substituted to the objective function,

$$C = 15,000X + 5,000Y$$

```
= 742,500 + 1,010,000

= 1,752,500

Therefore, the shadow price for one hour of the mixing plant

= Rs. 1,752,500 - Rs. 1,750,000

= Rs. 2,500

Packing plant hours

1.5X + 0.5Y = 180

(1.5 * 50) + (0.5 * 200) = 180

= 5 hours, Slack

Whipping spread maximum demand = 260

Y = 260 - 200

= 60 packs, Slack
```

(4 marks)

(d)

Total gross profit on the operation	
Quantity = (40,000/5) *4) * (1,000/250)	= 128,000 packs
	Rs.
Sales value (128,000 * 75)	9,600,000
Input materials (32,000 * (125 – 15))	(3,520,000)
Further processing costs (128,000 * 30)	(3,840,000)
Building rentals	(80,000)
Gross profit/contribution	2,160,000
	Rs.
DDL's shares (2,160,000 * 25%)	540,000
Loss of profit (15 * 32,000)	(480,000)
Rental income	80,000
Monthly fixed costs	(<u>75,000)</u>
Incremental benefit	65,000

There is an incremental benefit of Rs. 65,000. Hence it is recommended to undertake the further processing proposal of the new investor.

(5 marks)

(Total: 20 marks)



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