CERTIFIED PUBLIC ACCOUNTANT

ADVANCED LEVEL 2 EXAMINATION

A2.2: STRATEGIC PERFORMANCE MANAGEMENT

DATE: THURSDAY 28, MAY 2026

MARKING AND ANSWER GUIDE

SECTION A

QUESTION ONE

Marking Guide

Sub	Description of marks allocation	Marks
a	Evaluate the profitability of each division and the MSP Ltd as a whole (group) under the current transfer pricing arrangement, and in light of the external supplier's offer to division P, discuss one problem that may arise for both Divisions if the transfer price remains at the current market price	
	Total Revenues: Award 0.5 mark for well calculated revenues	1.5
	Product S (transferred in): Award 1 mark for well calculated figure	1
	Other Materials: Award 0.5 mark for well calculated figure	1.5
	Direct Labor (FRW 480/hr): Award 0.5 mark for well calculated figure	1.5
	Variable overhead: Award 0.5 mark for well calculated figure	1.5
	Selling & distribution costs: Award 0.5 mark for well calculated figure	1.5
	Division and Group Profit: Award 0.5 mark for well calculated figure	1.5
	Implication: Award 1 mark for well explained problem	1
b	Advise on the optimal production mix for division S between external sales of product S and internal transfers to division P given constraint of 320,000 available labor hours and transfer price.	
	Determination of shortfall/deficit: Award 1 mark for well calculated figure	1
	Division S external Sales: Award 1 mark for well calculated figure	1
	Division S internal Sales: Award 1 mark for well calculated figure	1
	Product P external Sales: Award 1 mark for well calculated figure	1
	Unit Contribution: Award 0.5 mark for well calculated figure	1
	unit contribution per labor hours: Award 0.5 mark for well calculated figure	1
	Total opportunity cost: Award 1 mark for well calculated figure	1
	Opportunity cost per units: Award 0.5 mark for well calculated figure	0.5
	Transfer price: Award 1 mark for well calculated figure	1
	Optimal production Mix: Award 0.5 mark for well calculated figure on External sales of P,S internal& S for external sales	1.5
c	Assess the economic value added (EVA) of MSP Ltd	
	Any correct adjustment made to get NOPAT: Award 1 mark for well calculated figure	7
	Correct NOPAT: Award 0.5 mark for well calculated figure	0.5
	Correct capital employed: Award 2 mark for well calculated figure	2
	Any correct adjustment made to capital employed: Award 0.5 mark for well calculated figure	1.5
	Correct adjusted capital employed: Award 1 mark for well calculated figure	0.5
	Correct WACC: Award 2 mark for well calculated figure	2
	Correct EVA: Award 0.5 mark for well calculated figure	0.5
	Correct interpretation: Award 2 mark for well interpretation	1
d	Discuss the corporate governance problems faced by MSP Ltd, and recommend two specific governance reforms that MSP should implement immediately to address the concern raised by regulatory review.	

	Any problem identified relative to case study: Award 2 mark for well explained issue	10
	Recommended reforms to corporate governance framework: Award 2 mark for well explained reform	4
Total marks allocated		**50**

Answer Guide

a) Evaluate the profitability of each division and the MSP Ltd as a whole (group) under the current transfer pricing arrangement, and in light of the external supplier's offer to division P, AND discuss one problem that may arise for both Divisions if the transfer price remains at the current market price

Division's operating statement	**S**	**P**	**MSP Ltd as a whole company**
	FRW(million)	**FRW(million)**	**FRW(million)**
Sales (external)	504	840	1,344
Internal sales	360	-	360
Total Revenues	864	840	1,704
less: Variable costs			
Product S (transferred in)	-	-360	-360
Other Materials	-360	-144	-504
Direct Labor (FRW 480/hr)	-115.2	-72	-187.2
Variable overhead	-57.6	-36	-93.6
Selling & distribution costs	-50.4	-18	-68.4
Total variable costs	- 583.2	-630	-1,213.2
Total Contribution	280.8	210	490.8
less: Annual Fixed costs	-48	-18	-66
Division Profit	232.8	192	424.8
Rank	1	2	

Note: The total internal transfer price amounting to FRW 360 million is income to division S and a cost to division P .This cancels out at group level, so the group profit reflects only genuine external revenues and costs.

One problem that may arise for both Divisions if the transfer price remains at the current market price in light to the new external supplier offer to division P

1. **Division P's problem**: Division P currently pays FRW 3,600 per kg to Division S at the full market price. A new external supplier now offers Product S at FRW 3,300 per kg which is FRW 300 cheaper. A rational divisional manager in Division P, evaluated on divisional profit, will prefer to buy externally as this reduces its cost and improves its own reported profitability. This creates pressure to bypass Division S entirely.
2. **Division S's problem**: If Division P switches to the external supplier, Division S loses 100,000 kg of internal transfers. Division S already sells its maximum external demand of 140,000 kg. It cannot redirect those 100,000 kg externally. The result is that Division S is left with significant idle capacity of 140,000 kg (along with the existing idle capacity of 40,000 kg) while continuing to bear fixed costs of FRW 48,000,000, severely damaging its profitability.

3. **Goal incongruence for the group**: What is rational for Division P (buy externally at FRW 3,300 per kg) is harmful to MSP Ltd as a whole. Division S's marginal cost of internal production is only FRW 1,680 per kg (see below), far below the external price of FRW 3,300. The group therefore loses value if Division P sources externally.

b) Advise on the optimal production mix for division S between external sales of product S and internal transfers to division P given constraint of 320,000 available labor hours and transfer price.

Using the standard transfer pricing principle:

Minimum TP (S's perspective) = Marginal cost of S + Opportunity cost

Labour hours per unit		
Product S	480/480	1
Product P	720/480	1.5

if labour hours available is 320,000 for both divisions,

Total hours required	**Hours**
Division S external Sales	140,000
Internal sales to Division P	100,000
Product P external Sales	150,000
Total hours required	390,000
Labour hours available	320,000
Shortfall	70,000

Unit contribution per labor hours (per unit of limiting factor)

Selling price (FRW)	3,600	8,400
Less: Variable costs (FRW)		
Other Materials	1,500	1,440
Direct Labor (FRW 480/hr)	480	720
Variable overhead	240	360
Selling & distribution costs	360	180
Material from S	-	3,600
Unit Contribution (FRW)	**1,020**	**2,100**
Labor hours per unit	1	1.5
Unit contribution per labor hour	1,020	1,400
Rank	2	1

Production plan before decision to prioritze internal transfer

Production plan	**Quantity**	**Hours per unit**	**Total Hours allocated**
Produce P External sales	100,000 packs	1.5	150,000
Produce S External sales	140,000 kg	1.0	140,000
Produce S internal sales	30,000 kg	1	30,000
Total hours allocated			**320,000**

The remaining unit to transfer (100,000 kg-30,000kg)=70,000 Kg

We should sacrifice external sales units of product S to be able to deliver the required internal sales:

Total opportunity cost	(FRW1,020*70,000 kg)	71,400,000
Opportunity cost per units	(71,400,000/100,000)	**714**

Transfer price= 2,580+714
Transfer price=3,294

Optimal production Mix			
Production plan	**Quantity**	**Hours**	**Total Hours allocated**
Produce P External sales	100,000	1.5	150,000
Produce S internal sales	100,000	1.0	100,000
Produce S external sales	70,000	1	70,000
Total hours allocated			**320,000**

c) Assess the economic value added (EVA) of MSP Ltd

Adjusted NOPAT		
Description	**Adjustment**	**Total (FRW 000,000)**
Profit Before Tax		3,889
Add back: Finance cost		1,920
EBIT (Before Eva adjustments)		5,809
Add back: Accounting Depreciation	880	
Less: Economic Depreciation	1,540	
Net Adjustment		-660
Add: provision for doubtful debt reversed		480
Add: Marketing expenditure capitalized		120
Adjusted EBIT:		5,749
Less: Tax 28%	(5,749*28%)	-1,609.72
NOPAT		**4,139.28**

Adjusted Capital Employed
Capital employed=5809/12.3%
Capital employed=47,227.64
Note that the ROCE is computed using the EBIT

Description	Frw 000,000
Capital employed	47,227.64
EVA adjustments:	
Add: Accumulated excess of economic over accounting Dep b/f	2160
Add: capitalized marketing expenditure (long term asset)	120
Add: Provision for doubtful debt reversed	480
Adjusted Capital Employed	**49,987.64**

Computation of WACC
Kd=12%(1-28%)= 8.64%

SN	Sources of finance	Weighting (%)	Cost of capital (%)	Weighted Average (%)
1	Equity	45	14	6.3
2	Debts	55	8.64	4.752
	Total			**11.052**

EVA=NOPAT-Capital Charge
EVA=4,139.28-(11.05%*49,987.64)= **-1,385.81 Million**

Interpretation:

The non-executive director's suggestion to adopt EVA is fully justified. ROCE of 12.3% appears to beat the industry average of 11.8% creating a misleading impression of value creation.
However, EVA reveals that the true economic cost of capital (11.052% * FRW ~49,988M) exceeds NOPAT by approximately FRW 1,386 million, confirming that MSP Ltd is destroying shareholder value. ROCE also encourages short-termism managers may reject positive NPV projects that dilute divisional ROCE. EVA aligns management behaviour with long-term value creation.

d) Corporate governance problems faced by MSP Ltd, and two specific governance reforms that MSP should implement immediately to address the concern raised by regulatory review.
Issues with coporate governance in MSP ltd and recommended reforms

1. Dual Role of CEO and Chairman (CEO Duality): Mr. Emmanuel Mugisha serves as both Chairman of the Board and Chief Executive Officer of MSP Ltd. This is a fundamental breach of good corporate governance, since the Chairman's role is to lead and oversee the board including holding the CEO to account while the CEO manages day-to-day operations. Combining both roles in one person eliminates this check and creates an unchecked concentration of power. The UK Corporate Governance Code and international best practice (including Rwanda's own guidelines) require these roles to be held by different individuals to ensure independent leadership of the board.

2. Board Dominated by Family Members hence lack of Independence: Five of the eight board members are close family relatives of Mr. Mugisha, and two are personal friends. This means seven of eight directors have personal relationships with the founder, creating serious conflicts of

interest and undermining the board's ability to challenge management objectively. Only one independent non-executive director (NED) exists. Corporate governance codes typically require a significant proportion of the board to be independent NEDs in MSP's case, the near-total absence of independence means the board cannot effectively scrutinise executive decisions, approve related-party transactions objectively, or protect minority shareholders.

3. Board Composition Unchanged for 15 Years ‘’Lack of Refreshment’’: The board has not changed since the company was founded fifteen years ago. Effective governance requires periodic board renewal to bring fresh perspectives, new skills, and updated knowledge. Long-tenured directors especially those with personal ties to the CEO risk becoming compliant and insufficiently critical. A nominations committee would normally manage the process of reviewing board composition and recommending new appointments, but no such committee exists at MSP Ltd.

4. Absence of Board Sub-Committees: MSP Ltd has no audit committee, no remuneration committee, and no nominations committee. These sub-committees are fundamental components of sound governance. An audit committee (composed of independent NEDs) would oversee financial reporting, internal controls, and the external audit relationship. A remuneration committee would ensure executive pay is set independently and fairly. Without these structures, all authority remains with the full board, which is itself dominated by the CEO's family, effectively meaning there is no independent check on executive remuneration or financial integrity.

5. No Internal Audit Function: A formal internal audit function has never been established at MSP Ltd. Internal audit provides independent assurance on the effectiveness of risk management, controls, and governance processes. Given that MSP is a sizeable company under regulatory scrutiny, the absence of internal audit leaves significant control risks unaddressed and makes it impossible to provide reliable assurance to the board and stakeholders.

6. Undisclosed Related Party Transactions: Reports indicate that transactions between MSP Ltd and businesses owned by family board members have not been properly disclosed in the financial statements. Related-party transactions are inherently high-risk and require full disclosure under both accounting standards (IAS 24) and corporate governance codes, to ensure shareholders and other stakeholders can assess whether such transactions were conducted at arm's length and in the company's best interests. Non-disclosure is a serious governance failure and potentially a legal violation.

7. **External Auditors Appointed Without Independent Oversight**: The external auditors are appointed directly by Mr. Mugisha without involvement of an audit committee or independent process. This undermines auditor independence one of the cornerstones of reliable financial reporting. An auditor appointed by and reporting to the same individual whose performance is being audited faces an obvious conflict of interest. Best practice requires auditor appointment to be managed by the audit committee and approved by shareholders.

8. **Concerns of Finance Director Dismissed**: The recently appointed Finance Director raised legitimate concerns about weak internal controls, lack of transparency in executive remuneration, and inadequate risk management. The fact that these concerns were dismissed by the majority board members illustrates that the board is not functioning as an effective oversight body.

Governance codes require boards to take such concerns seriously and investigate them through proper channels. Dismissal of the Finance Director's concerns increases the risk of financial misstatement and regulatory non-compliance.

Recommended Governance Reforms

1.Separate the Roles of Chairman and CEO: MSP Ltd should immediately appoint an independent, non-executive Chairman to replace Mr. Mugisha in that role. Mr. Mugisha may continue as CEO, but the Chairman's position must be held by a different individual with no executive responsibilities and no personal relationship with the CEO. This single reform would go a long way toward restoring the board's independence and its ability to hold management accountable. The RDB's regulatory concerns would be directly addressed, and institutional investors/lenders who have made continued financing conditional on governance improvements would gain confidence.

2. Establish an Audit Committee with Independent NEDs: MSP Ltd should recruit at least two additional independent non-executive directors and constitute an Audit Committee chaired by one of them. This committee should take over responsibility for overseeing financial reporting, approving related-party transactions, reviewing the work of external auditors, and commissioning an internal audit function. This would directly address the issues of undisclosed related-party transactions, uncontrolled auditor appointment, and absence of internal audit all flagged by the RDB and the Finance Director.

SECTION B

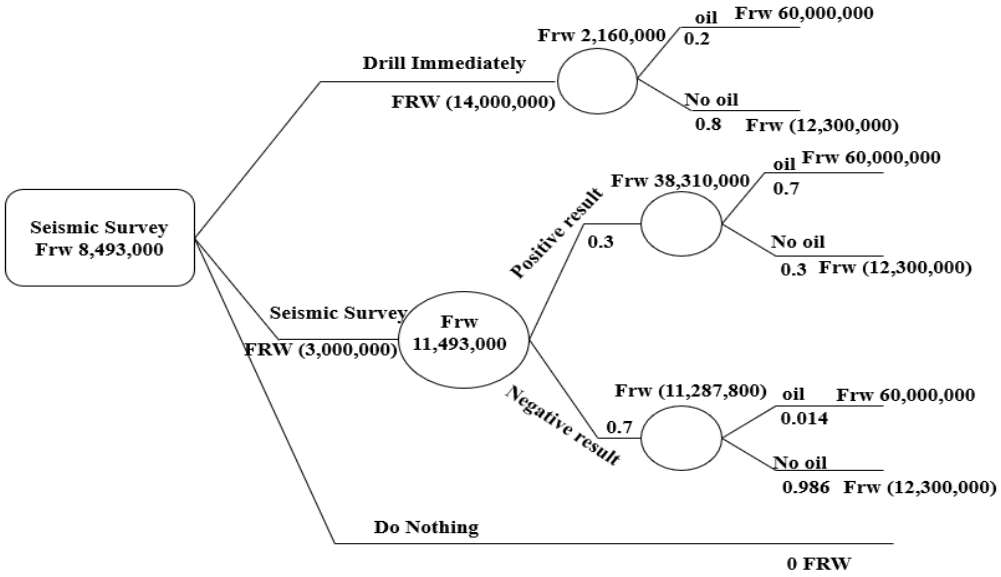
QUESTION TWO

Marking Guide

Sub qn	Description of marks allocation	Marks
a	Construct and evaluate a decision tree for KER's exploration decision. Clearly show all decision nodes, chance nodes, probabilities, expected values and the recommended course of action	
	Award 1 Mark for well-designed decision tree and 1 mark for each well calculated Expected Value (EV) (1 Marks for each EV and 2 Marks for Recommended course of action). Max: 10 Marks	10
b	i. Advise on the most profitable customer to IBL ltd	
	Contribution margin: Award 0.5 marks for well calculated contribution	1.5
	Overheads: Award 0.5 marks for well calculated overhead per customer along with its workings	6
	Profit: Award 0.5 marks for well calculated profit per customer	1.5
	Award 1 marks for correct advise	1
	ii. Identify the key observations revealed during analysis that would not have been visible under the company's current reporting system, and recommend two specific actions IBL's management should consider in response to your findings.	
	Key observation(finding): Award 1 marks for well explained point. Max: 3 Marks	3
	Recommended action to improve profit: Award 1 marks for well explained recommendation. Max: 2 Marks	2
Total marks allocated		25

Model Answer

a) Construct and evaluate a decision tree for KER's exploration decision. Clearly show all decision nodes, chance nodes, probabilities, expected values and the recommended course of action.



Recommended course of action:

Commission the seismic survey (FRW 3million) and drill only if the survey returns a positive result. This yields the highest EV of FRW 8,493,000, which is FRW 6,333,000 better than drilling immediately and FRW 8,493,000 better than doing nothing. The seismic survey efficiently filters out the high-probability dry-well scenario before committing to expensive drilling.

Workings:

- Drill immediately: EV= (60,000,000*0.2)+(12,300,000*0.8)= FRW 2,160,000
- Seismic survey:

Positive result, EV= (60,000,000*0.7)+(12,300,000*0.3)=FRW 38,310,000

Negative result, EV=(60,000,000*0.014)+(12,300,000*0.986)= FRW -11,287,800

Note: When the survey returns a negative result, KER's optimal decision is not to drill therefore Expected Value(EV) will be 0.7*0=0, because drilling has a negative EV of FRW 11,287,800. In a decision tree, at a decision node you choose the best action so you take the 0, not the negative FRW 11,287,800.

b) i) Advise on the most profitable customer to IBL ltd.

Description	**Kigali Supermart**	**Nyamirambo Traders**	**Remera Wholesale Hub**
Contribution	17,100,000	5,700,000	11,400,000
Less: Overheads			
Order processing	1,800,000	4,800,000	3,000,000
Delivery	2,400,000	6,400,000	4,000,000
Sales visits	960,000	2,560,000	1,600,000

Description	Kigali Supermart	Nyamirambo Traders	Remera Wholesale Hub
Invoice and credit administration	1,344,000	3,584,000	2,240,000
Total overhead	**6,504,000**	**17,344,000**	**10,840,000**
Net Profit	10,596,000	- 11,644,000	560,000
Rank	1	-	2

Advise: the most profitable customer is kigali supermart and second one is remera wholesale hub but nyamirambo traders is not profitable.

Workings:cost per activity /cost driver rate and allocation

Activities	Cost Driver	Cost Driver Rate	Kigali Supermart	Nyamirambo Traders	Remera Wholesale Hub
Order processing	Orders placed	60,000	1,800,000	4,800,000	3,000,000
Delivery	Deliveries made	66,667	2,400,000	6,400,000	4,000,000
Sales visits	Sales visits	160,000	960,000	2,560,000	1,600,000
Invoice and credit administration	Invoices raised	44,800	1,344,000	3,584,000	2,240,000

Note:

Cost driver rate:

- **Order processing:** 15Million/(250 Orders)=FRW 60,000 per order
- **Delivery:** 20 Million/(300 Deliveries)=FRW 66,667 per delivery

We have the case delivery rate, but we need to use the number of deliveries made. Therefore, we should multiply this rate by the number of cases sold to get the number of deliveries.
(4,500*0.8%) for Kigali Supermart, (1,500* 6.4%) for Nyamirambo Traders, and (3,000* 2%) for Remera Wholesale Hub.

The number of deliveries will be 36, 96, and 60 for Kigali Supermart, Nyamirambo Traders, and Remera Wholesale Hub, respectively.

- **Sales visits:** 8 Million/(50 Deliveries)=FRW 160,000 per sales visit
- **Invoice and credit administration:** 11.2Million/(250 Deliveries)=FRW 44,800 per invoice

Allocation to the customers:

- **Order processing:** Kigali Supermart (60,000*30), Nyamirambo Traders: (60,000*80), Remera Wholesale Hub: (60,000*50)
- **Delivery:** Kigali Supermart (66,667*36), Nyamirambo Traders: (66,667*96), Remera Wholesale Hub: (66,667*60)
- **Sales visits:** Kigali Supermart (160,000*6), Nyamirambo Traders: (160,000*16), Remera Wholesale Hub: (160,000*10)
- **Invoice and credit administration:** Kigali Supermart (44,800*30), Nyamirambo Traders: (44,800*80), Remera Wholesale Hub: (44,800*50)

ii) Key observation revealed by ABC Analysis

1.Gross contribution margin is a misleading performance indicator: Under IBL's current reporting system, all three customers appear equally profitable at the gross profit level each carries an identical gross margin of 42%. This gives management no basis for distinguishing between customers and might suggest that Kigali Supermart, as the highest-revenue customer, is the most valuable. The ABC analysis completely overturns this picture. Once customer-driven overheads are properly attributed, the true net profitability of each customer is revealed.

Kigali Supermart is highly profitable (FRW 10,596,000; 26% net margin), Remera Wholesale is marginally Profit-making (FRW 560,000; 2%) and Nyamirambo Traders is severely loss-making (FRW-11,644,000; -86%). The current system actively conceals this information from management.

2.Customer behaviour (not sales volume) drives profitability: The ABC analysis shows that Nyamirambo Traders places 80 orders per year to purchase only 1,500 cases. This means an average order size of fewer than 19 cases per order. In contrast, Kigali Supermart places only 30 orders to purchase 4,500 cases an average of 150 cases per order. The cost consequence is dramatic

Nyamirambo consumes FRW 17,344,000 in customer-related overhead to generate only Rwf 5,700,000 in gross profit a net overhead deficit of FRW 11,644,000. Nyamirambo demands frequent deliveries, numerous sales visits and high invoice volumes out of all proportion to its revenue contribution. This is the key observation of customer profitability analysis: the cost of serving a customer depends on how that customer behaves, not simply how much they buy.

3.Nyamirambo traders portfolio is loss-making: When ABC overhead is fully allocated, the combined net loss from the three main customers is FRW 488,000, despite total revenue of FRW 81,000,000. This means IBL is currently subsidising loss-making customer behaviour. Without this analysis, the company could continue investing resources in relationships that are destroying value, under the mistaken belief that high revenue equals profitability.

Recommended Actions

1.Restructure the terms of the relationship with Nyamirambo Traders

Nyamirambo Traders is loss-making by FRW -11,644,000 a net margin of -86%. This is not a minor inefficiency; the overhead cost of serving this customer is more than four times its gross profit contribution. IBL should immediately open commercial negotiations with Nyamirambo to restructure the relationship.

Specific measures could include:

(a) introducing a minimum order quantity (for example, no orders below 60 cases) to reduce the number of orders, deliveries and invoices;

(b) introducing delivery extras for small or non-standard deliveries to recover incremental costs or

(c) reducing the frequency of sales visits given the low revenue generated. If Nyamirambo refuses to adapt its ordering behaviour and the terms cannot be renegotiated to a break-even or profitable level, IBL Ltd should seriously consider terminating the relationship to avoid continued value destruction.

2.Use ABC data to negotiate pricing and set minimum order policies across all customers

IBL should use the ABC cost driver rates identified in this analysis to inform its commercial pricing and service policies going forward. For example, the cost per delivery is FRW 66,667. This means that a

customer requesting a delivery of fewer than approximately 21 cases (i.e. FRW 66,667/ FRW3,800 contribution per case) generates a delivery cost that exceeds the gross contribution from that delivery before any other overhead is considered.

IBL Ltd should insert these rates into its sales and pricing framework, making it clear that small, frequent orders carry real cost consequences. The company may also wish to offer incentives such as volume discounts or extended credit to customers who consolidate orders, since this directly reduces the overhead cost to serve and improves customer profitability without reducing revenue.

QUESTION THREE
Marking Guide

Sub qn	Description of marks allocation	Marks
a	**Calculate the following variances for NPL for the year ended 2025,**	
	Sales price variance, sales volume variance, market size variance and market share variance award 2 marks each Max: 8	8
b	**(i) Advise the NPL blend division on the profit-maximizing (optimal) output and selling price for Greige**.	
	Marginal cost per bucket: Award 1 mark for well calculated figure	1
	Total revenue: Award 1 mark for well calculated figure	1
	Marginal revenue: Award 1 mark for well calculated figure	1
	Optimal output (Q): Award 1 mark for well calculated figure	1
	Selling Price per Bucket: Award1 mark for well calculated figure	1
	Correct contribution for all output: Award 1 mark for well calculated figure	1
	Monthly profit: Award 1 mark for well calculated figure	1
	ii)Calculate the selling price and monthly profit under the current mark-up pricing policy (35% on total variable cost) assuming the division produces at the same quantity as in (b)(i).	
	Markup: Award 1 mark for well calculated figure	1
	Selling price under cost plus: Award 1 mark for well calculated figure	1
	Correct total revenue: Award 1 mark for well calculated figure	1
	Correct total variable costs: Award 1 mark for well calculated figure	1
	Correct monthly profit: Award 1 mark for well calculated figure	1
	Comparison with comment: Award 1 mark for well explained difference	1
c	The difference between corporate objectives and unit objectives, and discuss two reasons why unit objectives may conflict with the corporate objectives of NPL Ltd	
	Corporate Objective and Unit objective: Award 1 Mark for well explained difference (Max 2)	2
	two reasons why unit objectives may conflict with the corporate objectives: Award 1 Mark for well explained point	2
Total marks allocated		**25**

Model answer

a) Variances for NPL for the year ended 2025

i. sales price variance
(Budgeted price-Actual Price)*Actual Quantity Sold
(7,800-7,000)*490,000=392 million Adverse
ii. Sales volume variance
(Budgeted Quantity-Actual Quantity)*Std Contribution
(500,000-490,000)*1,400=14 million Adverse
Total sales variance=406,000,000 Adverse
iii. Market size variance
(Actual market size-Expected market size)*Budgeted market share*Std profit margin
(1,750,000-2,000,000)*25%*1,400=FRW 87,500,000 Adverse
iv. Market share variance
(Actual market share-Budgeted market share)*Actual market size*std profit margin
(28%-25%)*1,750,000*1,400= FRW 73,500,000 Favourable

	Budget	Actual
Total market size (litres)	2,000,000	1,750,000
NPL sales volume (litres)	500,000	490,000
Market share %	0.25	0.28

Standard contribution		FRW
Sales per bucket		7,800
Titanium Dioxide	12,000	120,000
Acrylic Resin	6,000	90,000
Solvent / Water	2,000	40,000
Additives	14,000	70,000
Total costs for 50 buckets		320,000
No of buckets		50
Standard Variable costs		6,400
Standard Contribution		1,400

b)

i) Advise the NPL Blend Division on the optimal output level and selling price for Greige that maximize profit, and quantify the corresponding maximum monthly profit.

Determination of marginal cost

Total Variable cost (marginal cost)	**FRW**
Raw materials (Acrylic, Vinyl-Acrylic Resins (Binders) and Water	320
Packaging materials	80
Direct labor	150
Variable factory overhead	50
Marginal cost (MC) per bucket	**600**

Derive marginal revenue (MR) from demand Function

P = 2,400 - 3Q (Q in Thousands of buckets per month)

Total Revenue= P*Q

TR=(2400-3Q)*Q

$TR=2400Q-3Q^2$

The marginal revenue will be given by the differentiation of the total revenue function:

Marginal revenue= MR = dTR/dQ 2400+6Q

Profit maximization function

MR=MC

2400-6Q=600

6Q=1,800

Q=300 Buckets per month or 300,000 buckets per month

substitute Q into demand function to find optimal price

P=2,400-(3*300)=2,400-900

P= FRW 1,500 Per Bucket

Monthly profit statement	**FRW (Million)**
Revenues (1,500*300,000 Buckets)	450
Less: Total Variable costs (600*300,000 Buckets)	180
Contribution	270
Less: Fixed production overhead	18
Less: Fixed selling & admin overhead	6.5
Monthly profit	245.5

ii)

The selling price and monthly profit under the current mark-up pricing policy (35% on total variable cost) and compare with (i) assuming the division produces at the same quantity as in (b)(i).

Total variable cost per bucket (FRW)	600
Add: Mark-up (FRW)	210
Cost plus selling price (FRW)	810

Monthly profit statement	**FRW (Million)**
Revenue	243
Less: Total Variable costs	180
Contribution Margin	63
Less: Fixed production overhead	18
Less: Fixed selling & admin overhead	6.5
Monthly Profit	38.5

Comment: comparison
Profit-maximising price (FRW 1,500): Monthly profit = FRW 245,500,000
Cost-plus price (FRW 810):Monthly profit = FRW 38,500,000
Additional Profit from MR=MC approach: FRW 207,000,000 per month

c) The difference between corporate objectives and unit objectives, and discuss two reasons why unit objectives may conflict with the corporate objectives of NPL.

- ✓ Corporate objectives are the overarching, long-term goals of the organisation as a whole. They reflect the interests of all stakeholders shareholders, customers, employees and society and guide strategic direction across every part of the business.
- ✓ Unit objectives are the shorter-term, operational targets set for individual SBUs or divisions. They typically focus on measurable financial metrics such as divisional profit, cost reduction, or return on investment that are within the direct control of division managers.

Reasons why unit objectives may conflict with the corporate objectives of NPL
1. Profit Maximisation at Divisional Level vs Overall Company Profit: the division manager is often evaluated based on divisional profit. As a result, the manager may make decisions that improve the division's results even if they reduce the profitability of the company as a whole.
2. Short-Term Divisional Targets vs Long-Term Corporate Strategy: Unit objectives usually focus on short-term measurable targets such as monthly profit, cost reduction, or ROI. Corporate objectives, however, often involve long-term strategic goals such as market development, product quality, or customer relationships.

QUESTION FOUR
Marking Guide

Subqn	Description of marks allocation	Marks
a	Advise Mr. Pacifique Ndayisaba on the most economically optimal time to undertake the replacement and determine the Net Present Value of the opportunity cost arising from wrong decision.	
	Site rental income for each option: Award max 1 Mark for a well-calculated figure	2
	Residual (disposal) value for each option: Award max 1 Mark for a well-calculated figure for option one and option 2 Award 0.5 Mark for a well-calculated figure	1.5
	Cost of a new generator unit for option one (replace every year): Award max 1 Mark for a well-calculated figure	1
	fuel, lubricants, monitoring costs for each option: Award max 1 Mark for a well-calculated figure	2
	Maintenance & Repair Costs for each option: Award max 1 Mark for a well-calculated figure	2
	PV of Net Cashflows for each option: Award max 1 Mark for a well-calculated figure	2
	NPV for each option: Award max 0.5 Mark for a well-calculated figure	1
	NPV of opportunity cost of wrong decision	0.5
b	Evaluate the expenditure budget for kanombe healthcare trust for the year ending 30th June 2026 (Award max 1 Mark for a well-calculated expenditure line figure)	
	Staff salaries: Award max 1 Mark for a well-calculated figure	1
	Workings:	
	Adjusted recurring salary base: Award max 0.5 Mark for a well-calculated figure	0.5
	3 months before pay rise: Award max 1 Mark for a well-calculated figure	1

	9 months after 3% rise: Award max 1 Mark for a well-calculated figure	1
	Medical supplies: Award max 1 Mark for a well-calculated figure	1
	Facility maintenance: Award max 1 Mark for a well-calculated figure	1
	Training & development: Award max 1 Mark for a well-calculated figure	1
	Administration & IT: Award max 1 Mark for a well-calculated figure	1
	Community outreach: Award max 1 Mark for a well-calculated figure	1
	Total budgeted expenditure: Award max 0.5 Mark for a well-calculated figure	0.5
c	Discuss the impact of automation to the client and how it may affect their performance management	
	Award max 1 mark for a well-explained impact of automation concept	4
Total marks allocated		**25**

Model Answer

a) Advise Mr. Pacifique Ndayisaba on the most economically optimal time to undertake the replacement and determine the Net Present Value of the opportunity cost arising from wrong decision.

Option one						
Replace every 1 year						
Description (years)	**0**	**1**	**2**	**3**	**4**	**5**
Cash inflows (FRW)						
Site rental income		25,440,000	26,976,000	28,584,000	30,288,000	32,112,000
Residual (disposal) value after one year of use		21,600,000	23,320,000	25,200,000	27,200,000	29,380,000
Total cash inflows		47,040,000	50,296,000	53,784,000	57,488,000	61,492,000
Cash outflows (FRW)						
Cost of a new generator unit	30,000,000	32,400,000	34,980,000	37,800,000	40,800,000	
Fuel, lubricants, monitoring costs		9,540,000	10,116,000	10,719,000	11,358,000	12,042,000
Maintenance & Repair Costs		678,000	766,200	865,800	978,000	1,105,200
Total cash outflows	30,000,000	42,618,000	45,862,200	49,384,800	53,136,000	13,147,200
Net Cash inflows	-30,000,000	4,422,000	4,433,800	4,399,200	4,352,000	48,344,800
PVIF@15%	1.000	0.870	0.756	0.658	0.572	0.497
PV of Net Cashflows	-30,000,000	3,847,140	3,351,953	2,894,674	2,489,344	24,027,366
NPV	6,610,476					

Option Two						
Replace every 5 year						
Description	**0**	**1**	**2**	**3**	**4**	**5**
cash inflows (FRW)						
Site rental income		25,440,000	26,976,000	28,584,000	30,288,000	32,112,000

Residual (disposal) value after one year of use						5,876,000
Total cash inflows		**25,440,000**	**26,976,000**	**28,584,000**	**30,288,000**	**37,988,000**
Cash outflows (FRW)						
Cost of a new generator unit	30,000,000					
fuel, lubricants, monitoring costs		9,540,000	10,116,000	10,719,000	11,358,000	12,042,000
Maintenance & Repair Costs		678,000	3,064,800	7,936,500	14,670,000	25,788,000
Total cash outflows	30,000,000	10,218,000	13,180,800	18,655,500	26,028,000	37,830,000
Net Cash inflows	-30,000,000	15,222,000	13,795,200	9,928,500	4,260,000	158,000
PVIF@15%	1.000	0.870	0.756	0.658	0.572	0.497
PV of Net Cashflows	-30,000,000	13,243,140	10,429,171	6,532,953	2,436,720	78,526
NPV	2,720,510					

Annual replacement should be considered and the Ruhande telecom ltd would forego FRW 3,889,966 if it incorrectly choose to retain each generator for five years rather tham replacing it annualy.

- Opportunity Costs of wrong Decision is FRW 3,889,966

Workings:

annual site rental income and operation cost inflation 6%					
W1. Site rental income	**Years**				
Site rental income	**1**	**2**	**3**	**4**	**5**
Site rental income (Real) FRW	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000
Inflation 6%	1.060	1.124	1.191	1.262	1.338
Site rental income (nominal) FRW	25,440,000	26,976,000	28,584,000	30,288,000	32,112,000

W2. Fuel, lubricants, monitoring costs	**Years**				
fuel, lubricants, monitoring costs	**1**	**2**	**3**	**4**	**5**
Fuel, lubricants, monitoring costs (real) FRW	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000
Inflation 6%	1.060	1.124	1.191	1.262	1.338
Fuel, lubricants, monitoring costs (nominal) FRW	9,540,000	10,116,000	10,719,000	11,358,000	12,042,000

W3. Purchase Costs		**Years**				
Site rental income	**0**	**1**	**2**	**3**	**4**	**5**
Site rental income (Real) FRW	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000
Inflation 8%		1.080	1.166	1.260	1.360	1.469

Site rental income (nominal) FRW		32,400,000	34,980,000	37,800,000	40,800,000	44,070,000

W4. Residual Income after one year of use	**Years**				
Residual Income	**1**	**2**	**3**	**4**	**5**
Residual Income (Real)-FRW	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Inflation 8%	1.080	1.166	1.260	1.360	1.469
Residual Income (nominal)-FRW	21,600,000	23,320,000	25,200,000	27,200,000	29,380,000

W5. Residual Income after five years of use	
Residual Income	**5**
Residual Income (Real) FRW	4,000,000
Inflation 8%	1.469
Residual Income (nominal) FRW	5,876,000

W6. Maintenance and Repair Costs if replacement happens every year

	Years				
Maintenance and Repair Costs	**1**	**2**	**3**	**4**	**5**
Maintenance and Repair Costs (Real) FRW	600,000	600,000	600,000	600,000	600,000
Inflation 13%	1.130	1.277	1.443	1.630	1.842
Maintenance and Repair Costs (nominal) FRW	678,000	766,200	865,800	978,000	1,105,200

W7. Maintenance and Repair Costs if replacement happens every 5 year

	Years				
Maintenance and Repair Costs	**1**	**2**	**3**	**4**	**5**
Maintenance and Repair Costs (Real)	600,000	2,400,000	5,500,000	9,000,000	14,000,000
Inflation 13%	1.130	1.277	1.443	1.630	1.842
Maintenance and Repair Costs (nominal)	678,000	3,064,800	7,936,500	14,670,000	25,788,000

b) Evaluate the expenditure budget for kanombe healthcare trust for the year ending 30th June 2026

Revised Budget Summary NKHT Year Ending 30 June 2026		
Expenditure Line	**Mr Habimana's Budget FRW '000**	**Revised Budget FRW '000**
Staff salaries (W1)	191,580	171,780
Medical supplies (W2)	67,200	57,750
Facility maintenance (W3)	39,520	28,080

Training & development (W4)	12,360	16,560
Administration & IT (W5)	22,660	22,660
Community outreach (W5)	9,270	9,270
TOTAL	342,590	306,100

Mr. Habimana's budget overstates required expenditure by FRW 36,490,000. The primary cause is that three significant non-recurring items

Workings

W1 Staff Salaries: Note: the 3% pay rise applies for only 9 of the 12 months in the budget year (effective 1 October 2025).	
Staff Salaries	**FRW '000**
Actual staff salaries 2025	186,000
Less: Non-recurring specialist supplement (research contract ended Mar 2025)	-18,000
Adjusted recurring salary base	168,000
Jul-Sep 2025 (3 months before pay rise): 168,000 * 3/12	42,000
Oct 2025-Jun 2026 (9 months after 3% rise): 168,000 * 1.03 x 9/12	129,780
Budgeted staff salaries	171,780

W2 Medical Supplies	
Medical Supplies	**FRW '000**
Actual medical supplies 2025	64,000
Less: Emergency PPE-disease outbreak (non-recurring, not expected 2026)	-9,000
(Recurring base * 1.05) 55,000 * 1.05	57,750
Budgeted medical supplies	57,750

W3:Facility Maintenance

Facility Maintenance	**FRW '000**
Actual facility maintenance 2025	38,000
Less: Emergency roof repairs (storm damage, non-recurring)	-11,000
(Routine base * 1.04) 27,000*1.04	28,080
Budgeted facility maintenance	28,080

W4 Training & Development	
Step	FRW '000
Actual training base x 1.03: 12,000 * 1.03	12,360
Add: Mandatory MoH clinical certification (from Jan 2026, additional)	4,200
Budgeted training & development	16,560

W5 Administration & IT and Community Outreach	
No specific adjustments required. Standard inflation applied to previous year actual figure:	

Item	Calculation	FRW '000
Administration & IT	22,000*1.03	22,660
Community outreach	9,000 *1.03	9,270

c) The impact of automation to the client and how it may affect KHT&RTI's performance management

1.**Internet of Things and Real-Time Data Collection:** Relevance to Ruhande: Internet of Things sensors installed on each generator can capture real-time data on fuel consumption, operating temperature, voltage output and maintenance alerts. This transforms performance measurement from periodic manual checks to continuous monitoring. Site-level dashboards would allow Mr. Ndayisaba to monitor the financial performance of every generator across the country in real time, providing far richer data to support future replacement cycle decisions than historical averages alone.

Relevance to KHT: Internet of Things monitoring of clinical equipment (cold chain storage, medical devices) would enable condition-based maintenance scheduling, helping KHT avoid the emergency repair expenditure (e.g. the FRW11m roof repair) that distorted this year's budget by providing early warning of deterioration.

2. Process Automation: Mr. Habimana's current budgeting process is entirely manual and dependent on a single individual. The company can automate routine processes such as extracting prior-year actuals, applying inflation factors, flagging non-recurring items, consolidating budget lines and generating variance reports. This would reduce the risk of the type of errors identified in this year's budget and free Mr. Habimana for higher-value analytical and strategic work.

On side of Ruhande: Automated invoice processing, lease income reconciliation and maintenance cost tracking across multiple tower sites would reduce administrative overhead and eliminate manual data entry errors as Ruhande's asset base grows.

3. **Big Data Analytics and Predictive Modelling:Ruhande**: Historical operational data from generators across all sites can be used to build predictive maintenance models that identify the exact point at which each unit's failure probability and cost profile make replacement optimal. This would add quantitative rigour to future replacement decisions and allow Ruhande to move beyond periodic NPV analysis toward dynamic, data-driven asset lifecycle management.

On the other hand

Analysis of historical expenditure patterns of KHT, donor funding cycles and patient demand data would allow KHT to build evidence-based budgets grounded in operational reality, rather than simple incremental adjustments that ignore structural changes in cost drivers.

4. Cloud-Based Enterprise Resource Planning (ERP) Systems: Both organisations currently produce financial reports that are delayed, incomplete or insufficiently scrutinised. Cloud-based ERP systems provide a single integrated data environment where financial and non-financial data is updated continuously and accessible to authorised users anywhere. For KHT, the board of trustees could access live budget-versus-actual reports at any time, enabling governance challenges that are currently absent. For Ruhande, real-time site-by-site financial reporting would allow Mr. Ndayisaba to monitor generator profitability, track lease income receipt and manage operating costs actively throughout his remaining tenure.

5. **Artificial Intelligence (AI) and Machine Learning:** AI-driven forecasting tools can identify patterns in historical data to produce more accurate projections of income and expenditure, reducing dependence on simple inflation-rate adjustments. For KHT, AI could distinguish between genuinely demand-driven expenditure lines and those that reflect budget padding or non-recurring

events -- directly addressing the weaknesses in Mr. Habimana's incremental approach identified in Part (b)(ii). For Ruhande, machine learning models could predict generator failure probabilities at each site, enabling smarter capital allocation decisions across the fleet.

6. **Balanced Scorecard and Integrated Reporting Enabled by IT**: The availability of large volumes of real-time operational, financial and non-financial data makes it practical for both organisations to implement a Balanced Scorecard (BSC) or integrated performance measurement framework. Ruhande could track performance across financial (NPV per site), customer (uptime percentage for the telecom operator), internal process (maintenance response times) and learning perspectives (staff technical competency). KHT could measure clinical outcomes per district, cost per patient served, donor satisfaction scores and staff training completion. Neither organisation currently measures performance beyond financial expenditure.

Note: Both clients should be aware of the risks associated with IT investment: significant upfront capital cost, cybersecurity vulnerabilities, data governance requirements, and the need for staff capability development. A phased implementation approach is recommended, prioritising the highest-impact applications (real-time monitoring for Ruhande; automated budgeting for KHT) before progressing to more complex systems.

End of Model Answer and Marking Guide.