CERTIFIED PUBLIC ACCOUNTANT

STRATEGIC LEVEL EXAMINATIONS

FM3.7: ADVANCED FINANCIAL MANAGMENT

DATE: THURSDAY 27, MAY 2026

MARKING GUIDE AND MODEL ANSWERS

SECTION A

QUESTION ONE

Marking guide

Qn	Description	Marks
a)		
	Award 0.5 marks for maintenance (55% relevant)	0.5
	For Rwanda	
	Award 0.5 marks for each inflated cash flow	2
	Award 0.5 marks for each depreciation tax saving	2
	Award 0.5 marks for each Unrelieved tax losses b/f	1
	Award 0.5 marks for each Taxation @30% (in arrears)	1
	For Uganda	
	Award 0.5 marks for each Spot rate (real local currency)	2
	Award 0.5 marks for each Profit before loss	2
	Award 0.5 marks for Unrelieved tax losses b/f	0.5
	Award 0.5 marks for Local tax @30%	1.5
	Award 0.5 marks for each Dividend declared (90%, floor 0)	1.5
	Award 0.5 marks for each Net remittance (local currency)	1.5
	Award 0.5 marks for each Net remittance (RWF'000 equivalent)	1.5
	For Tanzania	
	Award 0.5 marks for each Spot rate (real local currency)	2
	Award 0.5 marks for each Profit before loss	2
	Award 0.5 marks for Unrelieved tax losses b/f	0.5
	Award 0.5 marks for Local tax @30%	1.5
	Award 0.5 marks for each Dividend declared (90%, floor 0)	1.5
	Award 0.5 marks for each Net remittance (local currency)	1.5
	Award 0.5 marks for each Net remittance (RWF'000 equivalent)	1.5
	For consolidated	
	Award 0.5 marks for Infrastructure investment (net of sunk cost)	0.5
	Award 0.5 marks for Security systems investment	0.5
	Award 0.5 marks for Resale (salvage) value	0.5
	Award 0.5 marks for each year Working capital	2.5
	Award 0.5 marks for each PV	3
	Award 0.5 marks for NPV	0.5
	Award 1 mark for decision from NPV obtained	1
	Sub total	**36**
B	**Beta Factors and Risk Analysis for KDS's Digital Infrastructure Project**	
	Award 1 mark for explanation of systematic and unsystematic and 1 mark for relating to Beta for each	4
	Award 1 mark for each explanation of traditional beta	4
	Sub total	**8**
C	Award 1 mark for each well explained components of CIA Triad and 1 mark for each example	6
	Total	**50 Marks**

Model answer

REPORT TO THE BOARD OF DIRECTORS KANGA DIGITAL SOLUTIONS

To: Board of Directors
From:
Date: Today's date
Re: Digital Infrastructure Modernisation Project NPV Analysis

EXECUTIVE SUMMARY This report analyses the financial viability of the proposed digital infrastructure modernisation project, incorporating comprehensive NPV analysis and key investment considerations. The analysis indicates a positive NPV of RWF 128,594,000, suggesting the project will create significant shareholder value.

1. INVESTMENT OVERVIEW

The proposed investment comprises:

- Core infrastructure upgrade: RWF 3,050,000,000 (net of sunk costs)
- Security systems implementation: RWF 1,400,000,000
- Total initial investment: RWF 4,450,000,000

2. KEY FINANCIAL CONSIDERATIONS

2.1 Revenue Protection The project is expected to generate increasing revenue protection benefits, rising from RWF 1,200 million in Year 1 to RWF 3,600 million by Year 4. These figures represent prevented losses from enhanced security measures and improved operational efficiency.

2.2 Cost Structure Operating costs have been carefully analysed to include only incremental costs:

- Maintenance costs adjusted to 55% of total, excluding head office allocations
- Training costs included in full as project-specific expenditure
- Operating costs increasing in line with operational scale

2.3 Working Capital Requirements Working capital needs of 16% of revenue protection have been incorporated, with full recovery anticipated at project end. This represents a significant but necessary investment to support the expanded operational capacity.

3. FINANCIAL ANALYSIS

The detailed NPV calculation (shown in Appendix 1) incorporates:

- Inflation adjustment at 5.5% per annum
- Tax implications at 30% corporation tax rate
- Working capital requirements
- Terminal value considerations

Key findings:

- Positive NPV: RWF 128,594,000
- Strong positive cash flows from Year 2 onwards
- Significant terminal value contribution

- Project exceeds cost of capital requirements

4. RECOMMENDATIONS

Based on the financial analysis, I recommend that the Board:

1. Approve the digital infrastructure modernisation project
2. Proceed with immediate implementation to capture revenue protection benefits
3. Establish robust monitoring of cost control measures
4. Review working capital management procedures to ensure efficient capital utilisation
5. RISK CONSIDERATIONS

While the NPV is strongly positive, the Board should consider:

- Implementation risk during the transition period
- The importance of achieving projected revenue protection targets
- Working capital management requirements
- The impact of potential regulatory changes

Appendices containing detailed calculations and assumptions are attached.

Yours faithfully,

Financial Consultant

APPENDICES

Time	**0**	**1**	**2**	**3**	**4**	**5**
RWF'000 (unless stated)	RWF'000	RWF'000	RWF'000	RWF'000	RWF'000	RWF'000
Sales revenue		1,200,000	2,400,000	3,100,000	3,600,000	
Operating costs		(800,000)	(1,100,000)	(1,300,000)	(1,400,000)	
Training costs		(300,000)	(250,000)	(200,000)	(200,000)	
Maintenance (55% relevant)		(121,000)	(121,000)	(121,000)	(121,000)	
Net real operating cashflows		**(21,000)**	**929,000**	**1,479,000**	**1,879,000**	
COUNTRY SPLIT OF NET REAL OPERATING CASHFLOWS						
Rwanda (60%) - real RWF **(a)**		(12,600)	557,400	887,400	1,127,400	

Uganda (25%) - real RWF**(b)**		(5,250)	232,250	369,750	469,750	
Tanzania (15%) - real RWF **(c)**		(3,150)	139,350	221,850	281,850	
RWANDA (RWF'000)						
Inflation factor **(d)=(1+5.5%)^n**		1.0550	1.1130	1.1742	1.2388	
Inflated flows (nominal RWF) **=a*d**		(13,293)	620,400	1,042,022	1,396,651	
Tax allowable depreciation (W1)		350,000	262,500	196,875	340,625	
Taxable profit		**(363,293)**	**357,900**	**845,147**	**1,056,026**	
Unrelieved tax losses b/f			**(363,293)**	**(5,393)**		
Taxable profit after loss relief			**(5,393)**	**839,754**	**1,056,026**	
Taxation @30% (in arrears)			-	-	(251,926)	(316,808)
Add back TAD		350,000	262,500	196,875	340,625	
UGANDA (UGX'000)						
x Spot rate (real local currency) **(e)= b*3.4**		(17,850)	789,650	1,257,150	1,597,150	
Inflation factor **(f)=(1+6.8%)^n**		1.0680	1.1406	1.2182	1.3010	
Profit before loss **(e*f)**		(19,064)	900,694	1,531,443	2,077,929	
Unrelieved tax losses b/f		-	(19,064)	-	-	
Taxable profit after loss relief		-	881,630	1,531,443	2,077,929	
Local tax @30% (same year)		-	264,489	459,433	623,379	
After-tax profit/(loss)		(19,064)	636,205	1,072,010	1,454,550	
Dividend declared (90%, floor 0) **(g)**		-	572,584	964,809	1,309,095	
Withholding tax		-	57,258	96,481	130,910	
Net remittance (local currency) **g*(1-10%)**		-	515,326	868,328	1,178,186	
FX forecast rate (PPP), local ccy per RWF **1 (h)= 3.4*((1+6.8%)/(1+5.5%))^n**		3.4419	3.4843	3.5272	3.5707	
Net remittance (RWF'000 equivalent) =		-	**147,899**	**246,178**	**329,959**	

g*(1-10%)*h						
TANZANIA (TZS'000)						
x Spot rate (real local currency) **i=c*2.15**		(6,773)	299,603	476,978	605,978	
Inflation factor **j=(f)=(1+4.2%)^n**		1.0420	1.0858	1.1314	1.1789	
Profit before loss relief (nominal, local ccy)=**i*j**		(7,057)	325,298	539,636	714,377	
Unrelieved tax losses b/f		-	(7,057)	-	-	
Taxable profit after loss relief		-	318,241	539,636	714,377	
Local tax @30% (same year)		-	95,472	161,891	214,313	
After-tax profit/(loss)		(7,057)	229,825	377,745	500,064	
Dividend declared (90%)**k**		-	206,843	339,971	450,057	
Withholding tax		-	10,342	16,999	22,503	
Net remittance (local currency) **(k-10%)**		-	196,501	322,972	427,555	
FX forecast rate (PPP), local ccy per RWF 1 **(l)= 2.15*((1+4.2%)/(1+5.5%))^n**		2.1235	2.0973	2.0715	2.0460	
Net remittance (RWF'000 equivalent)= (k-10%)*l		-	**93,690**	**155,913**	**208,974**	
CONSOLIDATED GROUP CASH FLOW						
Infrastructure investment (net of sunk cost)	(3,050,000)					
Security systems investment	(1,400,000)					
Resale (salvage) value					4,100,000	
Rwanda taxable profit (link)		(363,293)	357,900	845,147	1,056,026	
Add back TAD (link)		350,000	262,500	196,875	340,625	
Rwanda taxation (link, arrears)			-	-	(251,926)	(316,808)
Uganda net remittance (RWF equiv., link)		-	147,899	246,178	329,959	
Tanzania net remittance (RWF equiv., link)		-	93,690	155,913	208,974	
Working capital (link to Working 2)	(202,560)	(224,842)	(155,022)	(131,139)	713,563	-

Cash flows	**(4,652,560)**	**(238,135)**	**706,967**	**1,312,973**	**6,497,220**	**(316,808)**
Discounting factor	1.0000	0.8712	0.7590	0.6612	0.5761	0.5019
P.V.	**(4,652,560)**	**(207,463)**	**536,583**	**868,184**	**3,742,848**	**(158,997)**
NPV (RWF'000)	**128,594**					

Workings

Working 1: Tax Allowable Depreciation (Rwanda Security Systems)					
Time	**0**	**1**	**2**	**3**	**4**
WDV start		1,400,000	1,050,000	787,500	590,625
Scrap (residual) value					(250,000)
Balancing allowance (Year 4)					340,625
TAD (25% reducing balance / balancing allowance Yr4)		350,000	262,500	196,875	340,625

Working 2: Working Capital (Consolidated Group Revenue Basis)					
Time	**0**	**1**	**2**	**3**	**4**
Rwanda revenue, nominal (RWF'000)		759,600	1,602,756	2,184,089	2,675,861
Uganda revenue, nominal (UGX'000)		1,089,360	2,326,873	3,209,921	3,981,131
Uganda revenue, RWF equivalent		316,500	667,815	910,037	1,114,942
Tanzania revenue, nominal (TZS'000)		403,254	840,381	1,131,083	1,368,684
Tanzania revenue, RWF equivalent		189,900	400,689	546,022	668,965
Consolidated group revenue (RWF'000 equiv.)		**1,266,000**	**2,671,260**	**3,640,148**	**4,459,769**
Cumulative WC required (16%)		202,560	427,402	582,424	713,563
Incremental WC investment/(recovery)	(202,560)	(224,842)	(155,022)	(131,139)	713,563

b) Beta Factors and Risk Analysis for KDS's Digital Infrastructure Project

The The Risk Committee's question is well founded, and the Board should be cautious about relying on a single, conventionally-derived beta to evaluate this project.

Systematic vs unsystematic risk

- Systematic (market) risk is the risk arising from economy-wide factors - interest rates, exchange rate movements, regional economic growth - that affects all firms to some degree and cannot be

eliminated through diversification. This is the risk that beta is designed to measure: it captures the sensitivity of a project's or company's returns to movements in the overall market.

- Unsystematic (specific) risk is risk unique to a company, industry or project - for example, the cyber-attack KDS has just experienced, execution risk on the infrastructure upgrade, or the loss of a single major merchant partner. Standard portfolio theory holds that a well-diversified investor can eliminate this risk by holding a broad portfolio, so it is not meant to be reflected in the discount rate (and, by extension, not in beta).

Why traditional beta assumptions sit uneasily with this investment

- Beta is normally estimated from listed, actively-traded comparable companies in a liquid market. Rwanda's capital market has very few (if any) directly comparable listed fintech/payments companies, so any beta used is likely to be a proxy borrowed from developed or larger emerging markets - raising serious questions over whether it reflects KDS's true risk profile, including regulatory, currency and political risk specific to Rwanda, Uganda and Tanzania.
- CAPM assumes shareholders hold well-diversified portfolios, so that unsystematic risk is irrelevant to the required return. KDS's ownership, and much of the East African investor base likely to hold or evaluate this project, may not be well diversified internationally; for such investors, project-specific risks - including the cyber-attack and its consequences - are not costlessly diversifiable and arguably should influence the discount rate or be reflected through other means (e.g. scenario analysis, a specific risk premium).
- KDS's dominant market position (over 70% of Rwanda's mobile money transactions) means that risks which look “unsystematic” from a textbook standpoint - an extended systems outage, a further breach, execution failure of the modernisation project - could have systemic consequences for Rwanda's national payments infrastructure and drive regulatory intervention. This is a source of risk that a market-derived beta, focused on share-price co-movement, would not capture at all.
- Beta reflects both business risk (revenue volatility, operating leverage) and financial risk (gearing). A project-specific beta for a major infrastructure overhaul, funded and risk-shared differently from KDS's existing operations, may differ materially from KDS's whole-company equity beta - using the latter unadjusted risks mis-pricing the discount rate for this specific project.
- The project introduces multi-currency exposure to Uganda and Tanzania that is unhedged. Currency and country risk of this kind is sometimes argued to be diversifiable for a globally diversified investor, but is unlikely to be diversifiable for KDS itself, or for a Rwanda-focused shareholder base, and is not distinctly reflected in a single group beta.

c**) CIA Triad Implementation**

Confidentiality Measures

Protecting sensitive information is crucial for KDS's digital infrastructure project. Data protection should be prioritised by implementing end-to-end encryption for all payment transactions,

establishing multi-layered access controls for customer data, and deploying advanced encryption for stored financial records. These measures ensure that sensitive information remains confidential and protected from unauthorized access.

Access management is another critical aspect of confidentiality. KDS should implement role-based access control (RBAC) to ensure that employees only have access to the information necessary for their roles. Establishing privileged access management systems will provide an additional layer of security for sensitive operations. Regular access right reviews and updates will help maintain the principle of least privilege and reduce the risk of unauthorized access.

Integrity Controls

Maintaining the integrity of transactions and data is vital for KDS's operations. Transaction security can be enhanced by implementing digital signatures for all transactions, deploying real-time transaction verification systems, and establishing automated reconciliation processes. These measures will help ensure that transactions are authentic, unaltered, and properly recorded.

Data accuracy is equally important for maintaining integrity. KDS should implement checksums for all data transfers to detect any alterations during transmission. Deploying blockchain technology for transaction logging can provide an immutable record of all transactions. Establishing audit trails for all system changes will help track and verify any modifications to the system, ensuring accountability and traceability.

Availability Measures

Ensuring system availability is crucial for KDS's continuous operations. System resilience can be improved by implementing redundant payment processing systems, establishing multiple data centres across East Africa, and deploying load balancing technology. These measures will help distribute the workload and provide backup systems in case of failures.

Business continuity is essential for maintaining availability during unforeseen events. KDS should establish real-time data replication to ensure that data is consistently backed up and available. Implementing automated failover systems will allow for quick recovery in case of system failures. Regular disaster recovery testing will help identify and address any weaknesses in the continuity plan, ensuring that KDS can maintain operations even in challenging circumstances.

SECTION B

QUESTION TWO

Marking guide

Qn	Description	Marks
a	For **Net Realisable Value (NRV) Method**	
	Award 1 mark for each adjustment (Property, PPE & Receivable)	3
	Award 1 mark for net realizable value (equity)	1
	Award 1 mark for value per share	1
	For **P/E Ratio Method**	
	Award 1 mark for Normalised EPS	1
	Award 1 mark for each value per share calculated	2
	Dividend Growth Model (Gordon Growth Model)	
	Award 1 mark for estimating the historic dividend growth rate	1
	Award 1 mark for CPAM	1
	Award 1 mark for Gordon growth	1
	Award 2 marks for overall recommendation	2
	Sub total	**13**
b	Award 2 marks each for clear explanation of each strategy	4
	Award 1 mark each for reference to specific factors in East Africa	2
	Sub total	**6**
c	Award 1 mark for well explained factors on acquired perspective	3
	Award 1 mark for well explained factors on target perspective	3
	Sub total	**6**
	Total	**25**

Model Answers

1. Net Realisable Value (NRV) Method

This treats the company on a break-up/liquidation basis - the minimum "floor" value, most relevant given a contested takeover where the bidder may look at asset backing, and given Sahara Capital's defensive interest in preserving underlying value.

Item	**Basis**	**RWF millions**
Property	4,200 × (1 − 6%)	3,948
Plant & Equipment	2,100 × (1 − 8%)	1,932
Inventory	Forced sale value	950
Receivables	850 × 92%	782
Cash	At face value	550
Total realisable assets		**8,162**
Long-term debt	At redemption/book value	(2,200)
Current liabilities		(1,300)
Redundancy/unwinding costs		(120)
Contingent environmental liability	Disclosed but unprovided - real cash cost on liquidation	(80)
Net Realisable Value (equity)		4,462

Value per share = RWF 4,462m ÷ 800,000 shares = RWF 5,578 per share

2. P/E Ratio Method

Step 1 - Normalise 20X4 earnings (remove non-recurring insurance gain):

- One-off gain per share = RWF 60m ÷ 800,000 shares = RWF 75
- **Normalised EPS** (20X4) = 1,500 − 75 = RWF 1,425

Step 2 - Apply relevant P/E multiples:

Basis	**P/E**	**Value per share (RWF)**
Industry average (listed comparable)	14	14 × 1,425 =19,950
Recent thinly-traded private acquisition	11.5	11.5 × 1,425=16,388

The industry average P/E (14) is drawn from liquid, actively-traded listed comparables and likely reflects a minority-interest, marketable basis - it may need upward adjustment for a control premium, since Umuhate is seeking outright control, not a portfolio stake.
The thinly-traded transaction P/E (11.5) is lower, plausibly because of an illiquidity/marketability discount in that deal, or because it already reflects a private, closely-held business without RSE listing benefits. It may understate Ikizere's true multiple since Ikizere itself is listed (with a liquid RSE quotation).

3. **Dividend Growth Model (Gordon Growth Model)**

Step 1 - **(geometric, 20X1–20X4):**

g = (750/480)^(1/3) − 1 = 16.0%

(Cross-checked: year-on-year growth rates were 14.6%, 18.2%, and 15.4% - reasonably consistent, supporting the compound estimate.)

Step 2 - **Estimate the cost of equity using CAPM:**

Ke = Rf + β(Rm − Rf) = 5.5% + 1.2 × (20% − 5.5%) = 5.5% + 17.4% = 22.9%

Step 3 - **Apply the Gordon Growth Model:**

$P_0 = D_0(1+g) / (Ke − g) = 750 × 1.16 / (22.9\% − 16.0\%) = 870 / 6.9\%$

Value per share ≈ RWF 12,609

Recommendation for negotiation purposes:

No single method should be relied on in isolation. The NRV of RWF 5,578 should be used only as an absolute floor/downside reference (relevant chiefly if the deal fails and liquidation becomes a real prospect).

he P/E and DGM methods together suggest a realistic going-concern range of roughly RWF 12,600–20,000 per share, before any control premium.

Because Umuhate is bidding for control, not a minority stake, and because a competing interested party (Sahara Capital) exists, the board's advisers should anchor initial negotiations near the upper end of this range (industry P/E-based, c. RWF 19,950–20,000), and expect the final negotiated price to include a control premium (commonly 20–30%) on top of a fair going-concern estimate, recognising that the existence of a competing bid materially strengthens Ikizere's negotiating position.

b) Hostile takeover defence strategies

1. White Knight Defence Strategy

This defence strategy involves seeking a friendly investor or company (the 'white knight') to acquire or invest in the target company as an alternative to the hostile bidder.

Key aspects in East African context:

- Leverages regional business networks and alliances common in East African markets
- Aligns with Rwanda's investment promotion framework which encourages strategic partnerships
- Preserves local operational autonomy while still achieving strategic alignment
- Creates competitive bidding environment that can significantly increase shareholder value

Implementation:

- Identify potential friendly acquirers with strategic interest in East African expansion
- Approach regional investment funds or complementary businesses with compatible corporate cultures
- Negotiate preferential terms including management retention and operational continuity
- Structure deals to satisfy regional regulatory requirements and foreign ownership restrictions

Regional example: Equity Bank of Kenya successfully employed this strategy when facing acquisition pressure from a Nigerian financial institution, ultimately partnering with a regional private equity consortium that maintained the bank's East African identity while providing capital for expansion.

2. Crown Jewel Defence Strategy

This strategy involves selling or spinning off the company's most valuable assets ("crown jewels") to reduce its attractiveness to hostile bidders.

Key aspects in East African context:

- Particularly effective for Ikizere's property assets which have significant value above book value
- Can be structured as temporary measures using regional trust structures common in East Africa
- Effective in cross-border acquisition attempts within East Africa where regulatory frameworks differ
- Allows retention of operational control while transferring legal ownership

Implementation:

- Identify and separate key assets (property portfolio would be primary candidate)
- Create asset holding structures or sell to friendly third parties
- Establish option agreements to reacquire assets if takeover fails
- Structure transactions to comply with regional exchange control regulations

Regional consideration: The East African Community framework must be considered when implementing this strategy, as cross-border asset transfers have specific regulatory requirements.

Other hostile takeover defence strategies

Poisson Pill: One of the most popular anti-takeover defenses is the poison pill. Poison pills represent rights or options issued to shareholders and bondholders. These rights trade in conjunction with other securities and they usually have an expiration date. When a merger occurs, the rights are detached from the security and exercised, giving the holder an opportunity to buy more securities at a deep discount. For example,stock rights are issued to shareholders, giving them an opportunity to buy stock in the acquiring company at an extremely low price. The rights cannot be exercised unless a tender offer of 20% or more is made by another company. This type of issue is designed to reduce the value of the Target Company. Flip-over rights provide for purchase of the Acquiring Company while flip-in rights give the shareholder the right to acquire more stock in the Target Company. Put options are used with bondholders, allowing them to sell-off bonds in the event that an unfriendly takeover occurs. By selling off the bonds, large principal payments come due and this lowers the value of the Target Company.

Green Mail: If the acquirer is an investor or group of investors, it might be possible to buy back their stock at a special offering price. The two parties hold 66 of 92 private negotiations and settle for a price. However, this type of targeted repurchase of stock runs contrary to fair and equal treatment for all shareholders. Therefore, green mail is not a widely accepted anti-takeover defense.

Pac Man Defense: As a last resort, the target company can make a tender offer to acquire the stock of the hostile bidder. This is a very extreme type of anti- takeover defense and usually signals desperation. One very important issue about anti-takeover defenses is valuations. Many antitakeover defenses (such as poison pills, golden parachutes, etc.) have a tendency to protect management as opposed to the shareholder. Consequently, companies with anti-takeover defenses usually have less upside potential with valuations as opposed to companies that lack anti-takeover defenses. Additionally, most studies show that anti-takeover defenses are not successful in preventing mergers. They simply add to the premiums that acquiring companies must pay for target companies.

Stand Still Agreement: The acquiring company and the target company can reach agreement whereby the acquiring company ceases to acquire stock in the target for a specified period of time. This stand still period gives the Target Company time to explore its options. However, most standstill agreements will require compensation to the acquiring firm since the acquirer is running the risk of losing synergy values.

Litigation: One of the more common approaches to stopping a merger is to legally challenge the merger. The Target Company will seek an injunction to stop the takeover from proceeding. This gives the target company time to mount a defense. For example, the Target Company will routinely challenge the acquiring company as failing to give proper notice of the merger and failing to disclose all relevant information to shareholders.

Factors Influencing Acquisition Pricing in East African Cross-Border Context

From Acquirer's Perspective we would need to consider the following factors:

1. **Currency Risk Considerations**
    - East African currencies show significant volatility against major international currencies
    - Acquirers must factor in potential devaluation of target country's currency
    - Hedging costs for cross-border transactions affect overall acquisition price
2. **Regulatory Environment**
    - Varying levels of foreign ownership restrictions across East African countries
    - Competition authority approvals with different thresholds in each jurisdiction
    - Exchange control regulations affecting capital repatriation post-acquisition
3. **Synergy Valuation**
    - Regional market access benefits may justify premium pricing
    - Supply chain integration opportunities specific to East African infrastructure
    - Cost savings from shared services across multiple regional markets

From Target's Perspective we would need to consider the following factors:

1. **Control Premium Expectations**
    - Regional ownership concentration typically requires significant control premiums
    - Family ownership structures common in East African businesses demand relationship-based negotiations
    - Historical precedents in similar transactions shape minimum acceptable premiums
2. **Strategic Alternative Assessment**
    - Regional expansion possibilities may provide alternative growth paths
    - Potential for IPO in developing East African capital markets
    - Strategic partnerships as alternatives to full acquisition
3. **Valuation of Growth Potential**

- Rapidly growing East African economies justify higher multiples than developed markets
- Target companies may value their regional knowledge and networks higher than acquirers
- Divergent views on future regional economic integration benefits

The significant gap between the asset-based valuation (RWF 5,828) and earnings-based valuations (RWF 21,000) highlights the challenge of pricing acquisitions in growth markets. This disparity is particularly relevant in East African contexts where book values often significantly understate economic value due to historic cost accounting in inflationary environments.

QUESTION THREE

Marking guide

Qn	Description	Marks
a	**For forward hedge**	
	Award 1 mark for calculating guaranteed cost	1
	Award 1 mark for each outcome for each spot rate scenario	2
	For Future hedge	
	Award 0.5 marks for number of contracts	0.5
	Award 1 mark for basis (2 of the original 6 months)	1
	Award 1 mark for each outcome for each spot rate scenario	2
	Award 1.5 marks for conclusion	1.5
	Sub total	**8**
b	Award 1 mark for Number of contract	1
	Award 1 mark for each outcome for each spot rate scenario	2
	Award 1 mark for comment	1
	Sub total	**4**
c	Award 1 mark for calculating amount to borrow	1
	Award 1 mark for depositing to FRW	1
	Award 1 mark for converting to FRW	1
	Award 1 mark for calculating amount to invest/ deposit	1
	Award 1 mark for comment	1
	Sub total	**5**
d	Award 1 mark for well explained TARA components	4
e	Award 1 mark for each well explained BCP	4
	Total	**25**

Model Answers

(a) Forward Hedge versus Futures Hedge - Critical Evaluation and Comparison

Forward hedge

KDS requires GBP to pay a UK supplier, so it must buy GBP forward / sell RWF forward. The company therefore uses the offer (ask) side of the quote.

Relevant rate: 4-month forward (to end July) = RWF 1,485 – 1,500; KDS buys GBP at RWF 1,500.

Guaranteed cost = £12,000,000 × 1,500 = RWF 18,000,000,000, fixed irrespective of the spot rate on the payment date.

Scenario	Spot rate	Unhedged cost (RWF)	Forward-hedged cost (RWF)	Outcome vs. market
(i)	1,470	17,640,000,000	18,000,000,000	Forward RWF 360,000,000 more expensive - opportunity loss
(ii)	1,520	18,240,000,000	18,000,000,000	Forward saves RWF 240,000,000 - favourable outcome

Correct workings and interpretation of both scenarios.

Futures hedge

GBP/RWF futures mature quarterly (June, September); there is no July contract, so KDS must use the September contract and close out early at end of July - a maturity mismatch that creates basis risk which a forward does not have.

Number of contracts = £12,000,000 ÷ £500,000 = 24 contracts (an exact hedge here). KDS goes long (buys) 24 September futures at RWF 1,505, since it needs to protect against GBP appreciation.

Basis at 1 April; 1,505 − 1,457.5 (spot mid) = 47.5. Assuming the basis narrows to zero on a straight-line basis to maturity, the basis remaining when the position is closed out at end July (2 of the original 6 months left) = 47.5 × 2/6 ≈ 15.83.

Scenario	Spot at close-out	Implied futures price	Gain/(loss) on 24 contracts	Net RWF cost
1,470	1,470	1,485.83	-230,000,000	17,870,000,000
1,520	1,520	1,535.83	370,000,000	17,870,000,000

Correct computation of gain/loss and net cost under both scenarios.

Critical comparison

- Both hedges achieve a broadly similar, near-fixed RWF cost (≈ RWF 18.0bn forward vs ≈ RWF 17.87bn futures), showing both are effective at removing the transaction exposure and converting an uncertain payment into a known, budgetable cash flow.
- The forward is tailored exactly to the amount and date required and carries no basis risk, but is an OTC contract with counterparty risk and no interim cash flow; the futures hedge is standardised and exchange-traded (more liquid, lower counterparty risk, transparent daily pricing) but is exposed to basis risk (quarterly maturities not matching the July cash flow) and to margin calls, which have treasury cash-flow/liquidity implications.

- Given the tender outcome is uncertain for one month, reversibility matters: the futures position can be closed out instantly on the exchange at the prevailing price if KDS loses the tender, whereas the forward must be reversed with the bank (an offsetting forward), which may be slower and could crystallise a cost or benefit depending on how rates have moved by then.

(b) Currency Options Hedge

KDS is buying GBP, so it should buy GBP CALL options (the right, not the obligation, to buy GBP at the exercise price). Number of contracts = £12,000,000 ÷ £250,000 = 48 contracts.

Recommended exercise price: RWF 1,500 (at-the-money relative to the 4-month forward rate of 1,500), premium 25 points.

Justification: an exercise price close to the forward rate keeps the premium to time value only (25 points), giving a maximum cost close to the forward/futures hedges while preserving the benefit of a lower cost if GBP weakens. A deep in-the-money strike (e.g. 1,425) costs far more in premium and behaves like an expensive forward with little remaining optionality; a deep out-of-the-money strike (e.g. 1,525) is cheap but gives inadequate protection (a higher worst-case cost).

Scenario	Spot	Decision	Calculation	Total RWF cost
1,470	1,470	Lapse - buy GBP in the spot market	12,000,000 × (1,470 + 25)	17,940,000,000
1,520	1,520	Exercise - buy GBP at 1,500	12,000,000 × (1,500 + 25)	18,300,000,000

Correct treatment (exercise/lapse) and cost computation for both scenarios.

Comparison: the option caps the maximum cost at RWF 18,300,000,000 - slightly worse than the forward/futures in the high-spot scenario because of the premium paid - but is cheaper than the forward (RWF 17,940,000,000 vs RWF 18,000,000,000) in the low-spot scenario, since KDS keeps the benefit of a weaker GBP. Options therefore give one-sided (asymmetric) protection at the cost of an upfront premium, whereas the forward and futures fix the cost symmetrically in both directions.

(c) Money Market Hedge

Method: borrow RWF today, convert immediately to GBP at spot, and place the GBP on deposit so that it matures to exactly £12,000,000 in 4 months (removing the exchange-rate exposure at the point of conversion, since the deposit growth and RWF loan roll-forward are both known today).

GBP to deposit now = £12,000,000 ÷ (1 + 3% × 4/12) = £12,000,000 ÷ 1.01 = £11,881,188.

Convert to RWF today at the spot ask rate (buying GBP) of 1,465: RWF required today = £11,881,188 × 1,465 = RWF 17,405,940,596. This is the amount KDS borrows in RWF.

RWF loan grows at the RWF borrowing rate of 12% p.a. for 4 months (12% × 4/12 = 4%): repayment in 4 months = RWF 17,405,940,596 × 1.04 = RWF 18,102,178,220.

Guaranteed RWF cost of the payment via the money market hedge = RWF 18,102,178,220, fixed today and independent of the spot rate in July (so unaffected by either scenario (i) 1,470 or (ii) 1,520).

Comment: this is marginally more expensive than the forward hedge (RWF 18,000,000,000), consistent with interest rate parity - the forward and money-market routes should give similar results, and any material difference reflects bid/offer spreads in the spot, forward and deposit/loan rates used. Like the forward, it removes all exchange-rate uncertainty and is unaffected by the two spot scenarios given.

D) **Transfer:** KDS could transfer data security breach risks by purchasing cyber insurance specifically covering tender-related data breaches. This would provide financial protection if a breach compromises sensitive bid information. The policy could cover recovery costs, liability claims, and potential regulatory fines.

KDS could also transfer some risk by engaging an external specialised cybersecurity firm to handle sensitive tender data. This third-party specialist would assume responsibility for protecting the information, bringing expertise that might not exist internally.

Avoid: KDS could implement an air-gapped system for the tender documentation, physically isolating the computers containing sensitive bid information from unsecured networks. This complete separation would prevent external network attacks targeting the tender data.

The company could also restrict tender information to a need-to-know basis, with only essential personnel having access to the complete bid details. This minimises the risk of internal information leakage.

Reduce: KDS should implement multi-factor authentication for all systems containing tender information, requiring more than just passwords for access. This significantly reduces the risk of unauthorised access even if credentials are compromised.

Regular security testing, including penetration testing focused specifically on systems holding tender data, would help identify and address vulnerabilities before they can be exploited by attackers.

Comprehensive staff training on security awareness, with special emphasis on tender-related security protocols, would reduce the risk of social engineering attacks targeting the valuable bid information.

Accept: Some minor risks might need to be accepted if the cost of mitigation exceeds the potential impact. For example, KDS might accept the risk of having multiple authorised users accessing the tender data, as the alternative of limiting access to a single person could create operational bottlenecks.

(e) An effective business continuity plan (BCP) for KDS that addresses both financial and cyber security risks should include:

1. **Integrated Risk Assessment:** The BCP should begin with a comprehensive assessment that considers both financial disruptions (currency fluctuations, liquidity issues) and cyber

incidents (data breaches, system outages) as interconnected risks. The assessment should identify critical business functions, dependencies between financial and IT systems, and calculate potential impacts of combined scenarios.

2. **Financial Continuity Measures:** The plan should establish clear protocols for maintaining financial operations during disruptions, including:
    - Emergency liquidity arrangements with multiple banking partners
    - Backup payment processing systems
    - Alternative treasury management procedures
    - Decentralised financial approval processes for crisis situations
    - Documentation of key financial processes to enable execution by alternate staff
3. **Technical Recovery Infrastructure:** The BCP must detail the technical recovery architecture, including:
    - Redundant data centres with geographic separation
    - Regular data backup and validation procedures
    - Alternative communication channels for financial transactions
    - Offline copies of critical financial records and systems
    - Defined recovery time objectives (RTOs) and recovery point objectives (RPOs) for financial systems
4. **Crisis Management Structure:** A clear governance framework is essential, with:
    - A cross-functional business continuity team including both finance and IT specialists
    - Defined roles and responsibilities during different types of incidents
    - Decision-making authority and escalation procedures
    - Communication protocols for internal and external stakeholders
    - Regular crisis simulation exercises involving both financial and cyber scenarios

QUESTION FOUR
Marking guide

Qn	Description	Marks
A	**Profit-Maximising Pricing, Output and Capacity Allocation**	
	Marginal revenue formula	1
	Award 0.5 marks for Optimum Q and 0.5 marks for optimum P	1
	Unconstrained profit-maximising position for Mari Lite	
	Marginal revenue formula	1
	Award 0.5 marks for Optimum Q and 0.5 marks for optimum P	1
	Identifying the capacity conflict	1
	Award 1 mark for Marginal net contribution functions	1
	Award 2 mark for optimal Q for allocation (QM&Q1)	2
	Award 2 marks for Recommended strategy and overall profitability	2
	Sub total	**10**
B	Award 1 mark for calculating of each product	2
	Award 0.5 marks for each interpretation	1
	Sub total	**3**

C	Award 1 mark for each method	3
	Award 0.5 marks for tax implication on each method	1.5
	Award 1.5 marks for overall recommendation	1.5
	Sub total	**6**
D	Award 0.5 marks for increasing MC by 8%	0.5
	Award 0.5 marks for calculation of Quantity	0.5
	Award 0.5 marks for calculation of Price	0.5
	Award 0.5 marks for total contribution on original MC	0.5
	Award 0.5 marks for total contribution on revised MC	0.5
	Award 0.5 marks for calculation change in contribution	0.5
	Award 0.5 marks each for calculation of QM and QI	1
	Award 0.5 marks for computation of original net annual profit	0.5
	Award 0.5 marks for computation of revised net annual profit	0.5
	Award 0.5 marks for calculation change in net annual profit	0.5
	Award 0.5 marks for conclusion	0.5
	Sub total	**6**
	Total	**25**

Marking Guide

a) Profit-Maximising Pricing, Output and Capacity Allocation

Step 1: Unconstrained profit-maximising position for Mari

Mari's demand and combined marginal cost (Development + Implementation) are:

P = 60,000,000 − 2,000,000Q MC = RWF 20,000,000 per unit (8,000,000 Dev + 12,000,000 Impl)

Marginal revenue is derived from the inverse demand function:

MR = 60,000,000 − 4,000,000Q

Setting MR = MC to find the unconstrained profit-maximising quantity:

60,000,000 − 4,000,000Q = 20,000,000 Then 4,000,000Q = 40,000,000

Then Quantity, Q = 10 units

Price, P = 60,000,000 − 2,000,000(10) = RWF 40,000,000 per unit

This alone is within the 15-unit Development Division capacity, so Mari in isolation is not capacity-constrained.

Step 2: Unconstrained profit-maximising position for Mari Lite

P = 20,000,000 − 1,000,000Q MC = RWF 6,000,000 per unit

Marginal Revenue; MR = 20,000,000 − 2,000,000Q

20,000,000 − 2,000,000Q = 6,000,000

Then 2,000,000Q = 14,000,000

Then Quantity; Q = 7 units

Price; P = 20,000,000 − 1,000,000(7) = RWF 13,000,000 per unit

Step 3: Identifying the capacity conflict

Both products draw on the same Development Division resource, capped at 15 core systems per year:

Unconstrained total demand = Mari (10) + Mari Lite (7) = 17 units > 15 units available

A capacity shortfall of 2 units exists. Simply producing to each product's independent optimum is infeasible; capacity must be rationed to the combination of Qm (Mari) and Ql (Mari Lite) that maximises total contribution, subject to $Qm + Ql \leq 15$.

Step 4: Resolving the conflict - equating marginal net contribution (opportunity-cost / shadow-price method)

Because capacity is scarce, the correct allocation rule is not "whichever product has the higher own profit" but to allocate each unit of scarce capacity to whichever product earns the higher marginal contribution (MR − MC) at the margin, until the marginal contributions of the two products are equalised (the Lagrangian condition for a shared constraint) or capacity is exhausted.

Marginal net contribution functions:

Mari: MR − MC = (60,000,000 − 4,000,000Qm) − 20,000,000 = 40,000,000 − 4,000,000Qm

Mari Lite: MR − MC = (20,000,000 − 2,000,000Ql) − 6,000,000 = 14,000,000 − 2,000,000Ql

Equating marginal contributions subject to Qm + Ql = 15 (Ql = 15 − Qm):

40,000,000 − 4,000,000Qm = 14,000,000 − 2,000,000(15 − Qm)

40,000,000 − 4,000,000Qm = −16,000,000 + 2,000,000Qm

56,000,000 = 6,000,000Qm

Optimal Quantity, Q

Then Qm = 9.33 units = 9 Units

Then Ql = 5.67 units=6 Units

At this split, the shadow price (opportunity cost) of one unit of Development capacity is RWF 2,666,667 - the marginal contribution common to both products at the constrained optimum.

Step 5: Practical (integer) allocation and full contribution comparison

Since a "core system" is not a fraction of a unit, integer combinations around the exact solution are tested directly. Total contribution (before common fixed costs) at selected integer splits:

Mari (Qm)	Mari Lite (Ql)	Mari Price	Mari Contribution*	Mari Lite Contribution*	Total Contribution
8	7	44,000,000	192,000,000	49,000,000	241,000,000
9	6	42,000,000	198,000,000	48,000,000	246,000,000
10	5	40,000,000	200,000,000	45,000,000	245,000,000
11	4	38,000,000	198,000,000	40,000,000	238,000,000

**Contribution = (Price − Combined MC) × Q for each product.*

The 9 / 6 split maximises total contribution among feasible integer combinations (RWF 246,000,000), only RWF 333,333 below the theoretical continuous optimum (RWF 246,333,333 at Qm = 9.33 / Ql = 5.67) - confirming 9 Mari and 6 Mari Lite units per year as the practical recommendation.

Step 6: Recommended strategy and overall profitability

Product	**Optimal Q**	**Optimal Price (RWF)**	**Contribution per unit**	**Total Contribution**
Mari	9	42,000,000	22,000,000	198,000,000
Mari Lite	6	14,000,000	8,000,000	48,000,000
Total	15 (= full capacity)	-	-	246,000,000

Less: Development Division fixed costs (120,000,000)

Net annual profit from Mari + Mari Lite combined = RWF 126,000,

Recommendation: Nyanga should price Mari at RWF 42,000,000 (9 units/year) and Mari Lite at RWF 14,000,000 (6 units/year), fully utilising the 15-unit Development capacity.
This mix generates RWF 20,000,000 more contribution than producing Mari alone at its unconstrained optimum of 10 units, and RWF 5,000,000 more than an even 50/50-style split - because Mari Lite's marginal contribution per unit of scarce capacity exceeds Mari's beyond 9 units, so capacity should be shifted toward Mari Lite at the margin rather than left with Mari's stand-alone optimum of 10.

b) How price elasticity affects the Mari pricing decision.

For a linear demand curve P = a − bQ, point elasticity at any (P, Q) is:

$e = (1 / -b) \times (P / Q)$

Evaluated at each product's own profit-maximising point (where MR = MC on its individual demand curve):

Mari: Q = 10, P = 40,000,000, slope b = 2,000,000

e = (1 / 2,000,000) × (40,000,000 / 10) = −2

Mari Lite: Q = 7, P = 13,000,000, slope b = 1,000,000

e = (1 / 1,000,000) × (13,000,000 / 7) = −1.86

Product	Elasticity at Optimum	Interpretation
Mari	-2	Elastic: a 1% price rise leads to a ~2% fall in quantity demanded
Mari Lite	-1.86	Elastic: a 1% price rise leads to a ~1.86% fall in quantity demanded

c) Transfer Pricing Policy: Development Then Implementation

1. The three candidate transfer prices

Method	Basis of calculation	Transfer price (RWF/unit)
Market price-based	External benchmark price for comparable core systems in East Africa	35,000,000
Cost-plus (25% markup)	Full unit cost = Variable cost 8,000,000 + Fixed cost/unit 8,000,000* Then ×1.25	20,000,000
Dual pricing	Selling division (Dev) credited at market price; buying division (Impl) charged at cost-based price; difference eliminated on consolidation	35,000,000 (Dev) / 20,000,000 (Impl)

**Fixed cost per unit = RWF 120,000,000 ÷ 15 units full-capacity output (matches the Part (a) optimal combined output of Qm + Ql = 15) = RWF 8,000,000/unit; full unit cost = 16,000,000; cost-plus 25% = 16,000,000 × 1.25 = RWF 20,000,000. (This coincides numerically, but not conceptually, with the RWF 20,000,000 'combined marginal cost' figure used for pricing in Part (a), which excludes fixed-cost allocation.)*

2. Effect of each method on divisional profit and the transfer pricing decision rule

The classical transfer pricing rule is: use marginal cost when the supplying division has spare capacity (opportunity cost = 0); use market price (or market price less avoided selling costs) when the supplying division is operating at full capacity, because every internal unit displaces an external sale.

Here, the Part (a) solution uses all 15 units of Development capacity (Qm = 9 + Ql = 6). The Development Division is therefore capacity-constrained, and in pure opportunity-cost terms the theoretically correct transfer price is the market price of RWF 35,000,000.

However, applying RWF 35,000,000 mechanically produces a distorted outcome for Mari specifically. Using the optimal end-customer price of RWF 42,000,000 for Mari (Part a) and the Implementation Division's own variable cost of RWF 12,000,000:

Implementation Division margin per unit = 42,000,000 − 35,000,000 (transfer price) − 12,000,000 = (5,000,000) - a LOSS

A market-based transfer price would make the Implementation Division appear loss-making on Mari, even though the group as a whole earns RWF 22,000,000 of contribution per unit (42,000,000 − 20,000,000 combined MC). This would demotivate Implementation Division managers and could cause them to reject group-profitable business.

Cost-plus pricing avoids this distortion:

Development Division margin/unit = 20,000,000 − 8,000,000 = 12,000,000

Implementation Division margin/unit = 42,000,000 − 20,000,000 − 12,000,000 = 10,000,000

Group total = 12,000,000 + 10,000,000 = 22,000,000 (reconciles exactly to Part (a))

Cost-plus keeps both divisions visibly profitable and sums correctly to the group optimum, but it understates the Development Division's true opportunity cost of capacity (RWF 35,000,000 market value vs RWF 20,000,000 charged), which could cause Development managers to under-value capacity when deciding whether to accept internal orders versus selling to independent contractors externally, as the case permits.

3. Tax exposure - Rwanda parent vs Kenyan subsidiary

Kenyan-market Implementation activity is run through a Kenyan subsidiary (tax rate 30%) supplied by the Rwandan Development Division (tax rate 28%). The transfer price allocates group profit - and therefore taxable profit - between the two jurisdictions. Using Mari at P = RWF 42,000,000 as the illustrative unit:

Transfer price basis	**Rwanda (Dev) profit/unit @28%**	**Kenya (Impl) profit/unit @30%**	**Total tax/unit**	**Group profit/unit**
Market price (35,000,000)	27,000,000 Then tax 7,560,000	(5,000,000) Then tax 0 (loss)	7,560,000	22,000,000
Cost-plus (20,000,000)	12,000,000 Then tax 3,360,000	10,000,000 Then tax 3,000,000	6,360,000	22,000,000

Both methods produce the same pre-tax group profit (RWF 22,000,000/unit), but the market-price basis concentrates all profit in Rwanda and pushes the Kenyan subsidiary into a tax loss. Counter-intuitively, this raises current-year group cash tax (RWF 7,560,000 vs RWF 6,360,000/unit) because the Kenyan loss earns no immediate tax shield (only a carry-forward, whose value is discounted by time), even though Rwanda's rate is lower.

For the actual invoiced, tax-relevant transfer price between the Rwandan parent and the Kenyan subsidiary, use the cost-plus (25% markup) price of RWF 20,000,000, supported by a contemporaneous transfer pricing study benchmarking the 25% markup against comparable East African software cost-plus arrangements. This avoids generating an artificial Kenyan tax loss, reduces total group cash tax in the near term, and is far more defensible to KRA under the arm's length principle than a market-price transfer that leaves the Kenyan entity persistently loss-making.

d) Sensitivity: 8% Increase in Mari's Combined Marginal Cost

1. Recalculating Mari's stand-alone profit-maximising price and quantity

Development Division variable cost rises, increasing the combined marginal cost for Mari by 8%:

New combined MC = 20,000,000 × 1.08 = RWF 21,600,000 per unit

Re-solving MR = MC:

$60{,}000{,}000 - 4{,}000{,}000Q = 21{,}600{,}000$

$4{,}000{,}000Q = 38{,}400{,}000$

Then $Q = 9.6$ units

$P = 60{,}000{,}000 - 2{,}000{,}000(9.6) =$ RWF 40,800,000 per unit

2. Impact on stand-alone Mari profitability

	Original (MC = 20,000,000)	**Revised (MC = 21,600,000)**	**Change**
Quantity (units)	10.00	9.60	−0.40 (−4.0%)
Price (RWF)	40,000,000	40,800,000	+800,000 (+2.0%)
Contribution per unit (RWF)	20,000,000	19,200,000	−800,000 (−4.0%)
Total contribution (RWF)	200,000,000	184,320,000	−15,680,000 (−7.8%)

The cost increase is only partly passed through to customers: price rises by just RWF 800,000 (2.0%) against a cost rise of RWF 1,600,000 (8.0%) per unit, because with linear demand the profit-maximising response is to absorb roughly half the cost increase in margin and pass on the other half in price, while also cutting volume. Total contribution falls by RWF 15,680,000, a 7.8% decline - proportionally smaller than the 8% cost increase itself would suggest, reflecting this partial pass-through together with the quantity reduction.

3. Effect on the capacity-shared optimum and overall Board profitability

Re-solving the joint capacity allocation of Part (a) with the higher Mari cost (Mari Lite unaffected):

Mari marginal contribution: 38,400,000 − 4,000,000Qm Mari Lite marginal contribution: 14,000,000 − 2,000,000Q

Equating, with Qm + Ql = 15: Qm = 9.07 units, Ql = 5.93 units

This is barely different from the original allocation (Qm = 9.33, Ql = 5.67) - the recommended practical split of 9 Mari / 6 Mari Lite units from Part (a) remains the correct integer allocation even after the cost increase, i.e. the capacity decision is robust to this scale of cost shock. Recomputing profitability at the unchanged (9, 6) split with the new Mari cost:

	Original total profit	**Revised total profit**	**Change**
Mari contribution (Qm = 9)	198,000,000	183,600,000	−14,400,000
Mari Lite contribution (Ql = 6)	48,000,000	48,000,000	0
Total contribution	246,000,000	231,600,000	−14,400,000
Less: fixed costs	(120,000,000)	(120,000,000)	0
Net annual profit	126,000,000	111,600,000	−14,400,000 (−11.4%)

Conclusion: an 8% rise in Mari's combined marginal cost reduces Mari's own optimal quantity by 4% and price by only 2% (partial cost pass-through), cutting Mari's contribution by ~7.8% stand-alone. Applied to the Board's capacity-shared plan, group net profit falls by RWF 14,400,000 (11.4%), from RWF 126,000,000 to RWF 111,600,000 per year, while the 9/6 capacity split itself remains close to optimal and does not need to change materially. This confirms Mari's profitability is meaningfully - though not disproportionately - sensitive to cost inflation, and the Board should monitor cloud-hosting and currency-driven cost movements closely given Mari carries the larger share of scarce Development capacity.

End of Model Answers and Marking Guide.