CERTIFIED PUBLIC ACCOUNTANT

INTERMEDIATE LEVEL EXAMINATIONS

I1.1: MANAGERIAL FINANCE

DATE: THURSDAY 29, MAY 2025

MARKING GUIDE AND MODEL ANSWERS

SECTION A

QUESTION ONE
Marking scheme

		Details	Description	Marks	Total Marks
Q1	a)	i) Current ratio	**0.5 Marks for Formula, 0.5 Mark for correct Answer in each year**	1.5	
		ii) Quick Ration ratio	**0.5 Marks for Formula, 0.5 Mark for correct Answer in each year**	1.5	
		iii) Working capital Cycle			
		Inventory Turnover Period	0.5 Marks for Formula, 0.5 Mark for correct Answer in each year	1.5	
		Receivable collection Period	0.5 Marks for Formula, 0.5 Mark for correct Answer in each year	1.5	
		Creditors Payment Period	0.5 Marks for Formula, 0.5 Mark for correct Answer in each year	1.5	
		Working Capital Cycle	0.5 Marks for Formula, 0.5 Mark for correct Answer in each year	1.5	
	b)	**Comment to findings**	**Award 1 mark for a well Explained Point.**	3	
	c)	**The key areas of accounts receivable management**	**Maximum Four point (1 mark each, Maximum 4 points)**	4	
	d)	**Four Key Factors to be considered when formulating a working capital Management Policy**	**Maximum Four point (1Marks Each, Maximum 4 Point)**	4	
Total Marks					**20**

Model Answer

a) Current Ratio $= \dfrac{Current\ Asset}{Current\ Liabilities}$

	Formulas	**2023**	**2024**
a)	i) Current Ratio $\dfrac{Current\ Asset}{Current\ Liabilities}$	$\dfrac{102,000}{63,000}$ = **1.619**	$\dfrac{130,760}{60,000}$ = **2.179**
	ii) Quick Ratio $\dfrac{Current\ Asset - INventory}{Current\ Liabilities}$	$\dfrac{102,000 - 35,000}{63,000}$ = **1.063**	$\dfrac{130,760 - 60,000}{60,000}$ = **1.17**
	iii) Working Capital cycle		
	Inventory Turnover Days $\dfrac{Inventory}{Cost\ of\ Sales}$ * 365 days	$\dfrac{35,000}{150,000}$ * 365 days= **85 Days**	$\dfrac{60,000}{245,000}$ * 365 days = **89 Days**
	Add: Receivable collection period $\dfrac{Debtors}{Credit\ Sales}$ * 365 days	$\dfrac{65,000}{250,000}$ * 365 days = **95 days**	$\dfrac{70,760}{350,000}$ * 365 days = **74 Days**
	Less: Creditors Payment period $\dfrac{Creditors}{Cost\ of\ Sales}$ * 365 days	$\dfrac{35,000}{150,000}$ * 365 days = **85 Days**	$\dfrac{54,000}{245,000}$ * 365 days = **80 Days**
	Working Capital cycle	**95 Days**	**83 Days**

Working Capital Cycle= Inventory Days + Receivable Collection Period – Creditors Payment Period

Industry Working Capital Cycle= 90 days + 70 days – 85 days= **75 days**

b)

- Current ratio of PRIMO CONSRUCTION Company Ltd in two consecutive years was improved from 1.619 to 2.179 this means that company have sufficient cash to finance its short-term obligation when its fall due, but when compared to industry level's current ratio of 3:1 PRIMO CONSRUCTION Company Ltd have to improve the management of working capital in order to avoiding the liquidity problems:

Because Construction Sector require a lot Cash liquidity during the execution of the projects.

- Quick ratio of PRIMO CONSRUCTION Company Ltd in two consecutive years was improved from 1.063 to 1.179 quick ratio measures a company's capacity to pay its current liabilities without a need to sell its inventory or obtain additional financing. Quick ratio is considered a more conservative measure than current ratio; so, compare to industry level 1:1 company is in good position to meet its obligation because most of the Time inventory are less liquid asset

- Working capital cycle (operating cycle) refers to days required for a business to receive inventory, sell the inventory and collect cash from sell of the inventory, PRIMO CONSRUCTION Company Ltd Working capital cycle (operating cycle) was improved from **95 days** up to **83 days** with a reduction of 12 days so the liquidity problem is reduced but compared to industry level of **75 days** for PRIMO CONSRUCTION Company Ltd, it will be difficult to compete on the market without a proper management of its operating cycles. PRIMO CONSRUCTION Company Ltd have to negotiates with its suppliers to increases allowed credit terms so they can tie the amount owed to them in the business for certain period but they have to consider also the Reputation of the business for avoiding a problem of lack of suppliers. This will help to improve the Liquidity.

c) **Identify and explain the key areas of accounts receivable management**
1. **Formulation of policies**
   - A framework needs to be established within which management of accounts receivable in an organisation takes place. Those elements of the framework to be considered include terms of trade such as the period of credit offered, and early settlement discounts.
   - The organisation must also consider whether to **charge interest** on overdue accounts
   - A frame work must lay down procedures that will be needed for granting credit to new customers and determining what to do when accounts become overdue.
2. **Assessment of creditworthiness**
   - Information relating to new customers needs to be analysed. The risks and costs of a customer defaulting will need to be balanced against the profitability of the business provided by that customer.

3. **Credit Control**
   - This involves the initial investigation of potential credit customers and continuing control of outstanding accounts balance. The individual accounts receivable can be assessed using a Customers History analysis and a Credit rating system.

- The overall level of accounts receivables can be monitored using an aged accounts receivable listing and Credit Utilisation Report as well as reports of the level of bad debts.

4. Collection of amounts dues

- A company needs to have in place agreed procedures for dealing with overdue accounts. Examples include reminders, chasing payment by telephone or making a personal approach. If this does not work, the company could refuse to grants anymore credit to the customer, and then hire a specialist debt collection agency or as last resort, take legal action.
- The **ov**erall collection policy of the firm should be such that the administrative cost and other costs incurred in debt collection do not Exceeds the benefits from incurring those costs

d) **The key Factors to be considered when formulating a working capital**

1. Nature and size of the business
2. Firm's manufacturing cycle
3. Business fluctuations
4. Production policy
5. Firm credit policy
6. Availability of credit
7. Growth and expansion activities.

QUESTION TWO

Marking Guide

		Details	Description	Marks	Total Marks
Q2	**a)**	**NPV Computation**			
		Inflating Saving from operation activities from Year 2 to 5	0.5 Marks Each Maximum 2 Marks for correct Answer for Line	**2**	
		Inflating Licensing fees from Year 2 to 5	0.5 Marks Each Maximum 2 Marks for correct Answer for Line	**2**	
		Tax payment one years in arrears	1 Mark for correct Answer for Line	**1**	
		Tax saving from Capital allowance	0.5 Marks for each Maximum 2.5 Marks for correct Answer for Line	**2.5**	
		Initial Investment	0.5 Marks Awarded	**0.5**	
		Record of Scrap Value	0.5 Marks Awarded	**0.5**	
		Total of Cash flow	N/A		
		Positive Net Present Value	1 Mark Awarded	**1**	
		Correct Comment	0.5 Marks Awarded	**0.5**	
	b)	**Modified payback**	Modified payback period based on Discounted Cash Flow	Award 1 Mark for Formula, 1 Mark for cumulative cash flow and 1 Mark for Correct Computation	**3**	
	c)	**Buy decision**	Inflated Licensing fees from Year 1 to 5	Recorded from NPV	**1**	
			Tax Saving on Licensing Fees years in arrears	1 Mark for the correct Answer for the Line	**1**	
			Tax saving from Capital allowance	Recorded from NPV	**1**	
			Initial Investment	0.5 Marks Awarded	**0.5**	
			Record of Scrap Value	0.5 Marks Awarded	**0.5**	
			Discounted Cash Flow with Borrowing Rate	1 Mark for the correct Answer for Line	**1**	

		Details		Description	Marks	Total Marks
		Lease Decision	Cash flow before discounting with borrowing rate for each year Annual Lease rental recorded at start from Year 0 to 4 and Tax Saving on Lease Rental one year in arrears	0.5 Marks each, Maximum 3.5 Marks for correct Answer for Line	**3.5**	
			Discounted Cash Flow with Borrowing Rate	1 Mark for the correct Answer for Line	**1**	
			Comment Between Buy or Lease Decision		**0.5**	
	d)		The effects of taxation on the investment decision.	**Maximum 2 points (1 Mark each)**	**2**	
Total Marks						**25**

Model Answer

a) NPV analysis for undertaking the project

Details		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Saving from operating activities	5%		25,000,000	26,250,000	27,562,500	28,940,625	30,387,656.25	
License fees	4%		(5,000,000)	(5,200,000)	(5,408,000)	(5,624,320)	(5,849,293)	
Net Additional cash flow			**20,000,000**	**21,050,000**	**22,154,500**	**23,316,305**	**24,538,363**	
Tax at 30% one year in arrears	30%			(6,000,000)	(6,315,000)	(6,646,350)	(6,994,892)	(7,361,509)
Tax saving from capital allowance				3,750,000	2,812,500	2,109,375	1,582,031	1,746,094
Initial investment		(50,000,000)						
Scrap Value							10,000,000	
Cash flow		(50,000,000)	20,000,000	18,800,000	18,652,000	18,779,330	29,125,503	(5,615,415)
Discounting Factor	10%	1	0.909	0.826	0.751	0.683	0.621	0.564
PV of Cash flow		(50,000,000)	18,180,000	15,528,800	14,007,652	12,826,282	18,086,937	(3,167,094)
Net Cash flow								**25,462,578**

Project is viable with a positive NPV of above 25 million so AMAHOR can proceed with the project

Working 1 (Computation of Tax saving on Capital Allowance)

Working	Cost / reducing Balance	Deprecation Rate	Depreciation	Tax rate	Tax saving	Timing (for one Year in Arrears)
Year 1	50,000,000	25%	12,500,000	30%	3,750,000	Year 2
Year 2	37,500,000	25%	9,375,000	30%	2,812,500	year 3
Year 3	28,125,000	25%	7,031,250	30%	2,109,375	Year 4
Year 4	21,093,750	25%	5,273,438	30%	1,582,031	Year 5

Working	Cost / reducing Balance	Deprecation Rate	Depreciation	Tax rate	Tax saving	Timing (for one Year in Arrears)
Year 5	15,820,313	25%	5,820,313	30%	1,746,094	Year 6
Scrap value	(10,000,000)					
Balancing Figure	5,820,313					

b) Modified Payback Period

Year	Discounted cash flow	Cumulative Cash flow
Year 0	(50,000,000)	(50,000,000)
Year 1	18,180,000	(31,820,000)
Year 2	15,528,800	(16,291,200)
Year 3	14,007,652	(2,283,548)
Year 4	12,826,282	10,542,734
Year 5	18,086,937	28,629,672
Year 6	(3,167,094)	25,462,578

Modified Payback Period= 3 years + $\dfrac{Remaining\ Cash\ balance\ to\ payback}{Next\ year\ Cash\ flow}$ * 12 Months = 3 Years and 2 Months

Modified Payback Period= 3 years + $\dfrac{2,283,548}{12,826,282}$ * 12 Months = 3 Years and 2 Months

c) Buy or Lease Decision

Buy Decision Analysis

Details		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
License fees	4%		(5,000,000)	(5,200,000)	(5,408,000)	(5,624,320)	(5,849,293)	
Tax Shield on licensing fees	30%			1,500,000	1,560,000	1,622,400	1,687,296	1,754,788
Tax saving from capital allowance				3,750,000	2,812,500	2,109,375	1,582,031	1,746,094
Initial investment		(50,000,000)						
Scrap Value							10,000,000	

Details		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash flow		(50,000,000)	(5,000,000)	50,000	(1,035,500)	(1,892,545)	7,420,034	3,500,882
Borrowing Rate	**6%**	1	0.943	0.890	0.840	0.792	0.747	0.705
PV of Cash Flow		(50,000,000)	(4,715,000)	44,500	(869,820)	(1,498,896)	5,542,766	2,468,122
TOTAL PV Cost Cash flow								**(49,028,328)**

Lease Decision Analysis

Details		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Annual Lease Rentals		(15,000,000)	(15,000,000)	(15,000,000)	(15,000,000)	(15,000,000)		
Tax at 30% one year in arrears	30%			4,500,000	4,500,000	4,500,000	4,500,000	4,500,000
Cash flow		(15,000,000)	(15,000,000)	(10,500,000)	(10,500,000)	(10,500,000)	4,500,000	4,500,000
Borrowing Rate	**6%**	1	0.943	0.890	0.840	0.792	0.747	0.705
PV of Cash flow		(15,000,000)	(14,145,000)	(9,345,000)	(8,820,000)	(8,316,000)	3,361,500	3,172,500
TOTAL PV Cost Cash flow								**(49,092,000)**

Borrowing rate After Tax = Borrowing rate * (1-Tax rate) = 8.6% * (1-30%) = 6%

Decision: Buying the new technology is better than leasing

d) Effects of Taxation on Investment Decision

To appraise fully an investment, management must take account of the impact of taxation, as it is the after-tax cash flows that are relevant to decision making. As a result of accepting a project tax payments or savings will, generally, be made by the company.

These relate to:

• **Corporation Tax payments on profits:** Annual cash inflows from a project will cause an increase in taxable profits and, hence, a tax

payment. Annual cash outflows (e.g. cost of materials, labour etc.) will reduce taxable profits and yield tax savings. However, tax payments or savings can be based upon the net cash inflows or outflows each year

• **Tax benefits due to capital allowances granted on certain expenditure**: The Rwandan Revenue Authority does not allow depreciation charges as a deduction in calculating the tax payable. However, it does grant capital allowances, which can be quite generous. These allowances on capital items can be set-off against taxable profits to produce tax savings Allowing companies to depreciate   assets   can   lower   taxable   income,   increasing   cash   flow   and   making   certain   investments

QUESTION THREE

Marking Guide

		Details		Description	Marks	Total Marks
Q3	**a)**	**Choice option between Fixed term deposit or Remuneration account as Individual Investment by Coefficient of Variation**	Expected return for Fixed Term Deposit	0.5 Marks for Formula and 0.5 for corrected computation	**1**	
			Standard Deviation for Fixed Term Deposit	0.5 Marks for Formula and 0.5 for corrected computation	**1**	
			Coefficient of Variation of Fixed Term deposit	0.5 Marks for each asset with corrected computation	**1**	
			Expected return for Remuneration Account	0.5 Marks for Formula and 0.5 for corrected computation	**1**	
			Standard Deviation for Remuneration Account	0.5 Marks for Formula and 0.5 for corrected computation	**1**	
			Coefficient of Variation of Remuneration Account	0.5 Marks for each asset with corrected computation	**1**	
	b)	**Expected Portfolio Return**	**Expected Portfolio Return**	Award 1 Mark for Formula, 1 Mark for Correct Computation	**2**	
	c)	**The correlation coefficient between the two Investments**	Covariance Between Two Asset	Award 0.5 Marks for Formula, 1 Mark for Correct Computation	**1.5**	
			Coefficient of Correlation and Comment	Award 0.5 Marks for Formula, 0.5 Marks for Correct Computation and 0.5 for Comment	**1.5**	
	d)	**Portfolio Risk and comment on your Findings**	Portfolio standard deviation	Award 0.5 Marks for Formula, 1 Marks for Correct Computation and for 0.5 Comment	**2**	
	e)	**Capital Market Line**	Plot your Result on Capital market line		**2**	
Total Marks						**15**

Model Answer

a)

Analysis when we make investment in Fixed Term Deposit (A)

Expected Rate of return= Probability * Return

Standard Deviation = $\sqrt{Variance}$

Standard Deviation = $\sqrt{P * (Xa - Er(A))\wedge 2}$

Analysis when we make investment in Fixed Term Deposit (A)

State of Economy	Probability	Return of Fixed deposit	Probability * Return	Xa-Er(A)	(Xa-Er(A))^2	P * (Xa-Er(A))^2
Boom	0.4	0.20	0.08	0.051	0.002601	0.00104040
Normal	0.3	0.12	0.04	(0.03)	0.000841	0.00025230
Recession	0.3	0.11	0.03	(0.04)	0.001521	0.00045630
Expected Rate of return			15%			0.00174900
standard deviation						0.04

Analysis when we make investment in Remuneration account(B)

State of Economy	Probability	Return on Remuneration Account	Probability * Return	Xb-Er(B)	(Xb-Er(B))^2	P * (Xb-Er(B))^2
Boom	0.4	0.25	0.1	0.0765	0.005852	0.002341
Normal	0.3	0.14	0.042	(0.034)	0.001122	0.000337
Recession	0.3	0.105	0.0315	(0.069)	0.004692	0.001408
Expected return			17%			0.00409
Standard Deviation						0.06

Investment in Remuneration account has Expected rate of return of 17% with standard deviation of 6% while Investment in Fixed term deposit has expected rate of return of 14% with standard deviation of 5%

By comparing absolute measures of risk, Investment in Remuneration Account appears to be riskier because it has standard deviation of 6% Versus standard deviation of 5% of investment in Fixed term deposit

Coefficient of Variation= $\dfrac{Standard\ Deviation\ of\ Return}{EXPECTED\ RATE\ OF\ Return}$

Analysis when we make investment in Fixed Term Deposit (A)

Coefficient of Variation= $\frac{0.04}{0.15}$ = **0.2807**

Analysis when we make investment in Remuneration account(B)

Coefficient of Variation= $\frac{0.06}{0.18}$ = **0.3684**

Coefficient of Variation Measures Relative variability to indicate risk per Unit of Expected return, GOLF CLUB LTD will choose to invest in Fixed Term deposit because it has less relative Variability or lower risk per unit of Expected return compared to Remuneration Account

b) Expected Portfolio Rate of Return

Expected return on this Portfolio= [Er(A)*W(A)] + [Er(B)*W(B)]

Expected return on this Portfolio= [0.15*0.4] + [0.17*0.6] = 0.16 or 16%

c)

Coefficient of Correlation indicate linear relationship of Return between two investments in portfolio and Value between +1 and -1

Covariance of (Return A, Return B) = Sa * Sb* Coefficient of Correlation A, B

State of Economy	Probability	Xa-Er(A)	Xb- Er(B)	P*[Xa- Er(A)]*[Xb- Er(B)]
Boom	0.4	0.051	0.0765	0.0016
Normal	0.3	(0.03)	(0.034)	0.0003
Recession	0.3	(0.04)	(0.069)	0.0008
Covariance of (Return A, Return B				0.0027

Coefficient of Correlation (Pab)= $\frac{Covariance(A,B)}{Standard\ Deviation(A)*StarndardDeviation\ (B)}$

Coefficient of Correlation (Pab)= $\frac{0.0027}{0,04\ *\ 0.06}$ = 0.993

Based on our find this Two investment are Perfect Positive correlated meaning that the returns for the two assets in Portfolio move together in a completely linear manner.

d)

Portfolio Risk= $\sqrt{Wa^2 * Sa^2) + (Wb^2 * Sb^2 + 2 * Wa * Wb * Sa * Sb * Pab}$

Portfolio Risk= $\sqrt{0.4^2 * 0.04^2) + (0.6^2 * 0.06^2) + 2 * 0.4 * 0.6 * 0.04 * 0.06 * 0.993}$

$\sqrt{(0.000256) + (0.001296) + 0.001144}$ =0.052or 5.2 %

Wa = Weighting of Investment in Fixed deposit (A)

Wb= Investment in Remuneration account (B)

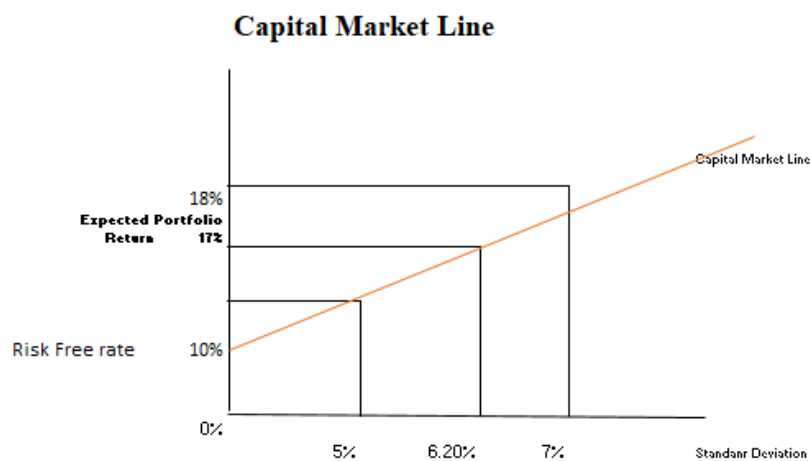Sa= Standard Deviation of Investment in Fixed Deposit (A)

Sb= Standard Deviation of Remuneration account (B)

Pab= Coefficient of Correction between two investments

Portfolio Risk equal to 5.2% by combing these two assets help to reduce risk below to market risk of 8%

e) Based on Result above, Plot your Result on Capital market line

Capital Market Line

SECTION B

QUESTION FOUR

Marking Guide

		Details	Description	Description	Marks	Total Marks
Q4	**a)**	The key features of Business Plan	Provide 8 Minimum Points	Award 0.5 Marks for outline, 1 Marks for Correct Explanation	12	
		Conditions for regarding Capital market as efficient and the three Forms of Efficiency	Conditions Required for regarding Capital market as efficient market	Award 1 Mark for each Maximum 4 Marks for Correct Answer	4	
	b)		three form of efficiency used in Efficient Market Hypothesis to tests degrees of efficiency	Award 1 Mark for outline All 3 form of Efficiency and 1 mark for Explanation Each Maximum 3 Marks for Correct Answer	4	
Total Marks						**20**

Model Answer

a) Part of BUSINESS PLAN

Before deciding whether an investment is worth backing the venture capitalist will expect to see a Business Plan. This should cover the following:

- **Product/Service** – what is unique about the business idea? What are the strengths compared to the competitors?
- **Management Team** – can the team run and grow a business successfully? What are their ages, relevant experience, qualifications, track record and motivation? How much is invested in the company by the management team? Are there any non-executive directors? Details of other key employees.
- **Industry** – what are the issues, concerns and risks affecting the business area?
- **Market Research** and **Sale Strategy**– do people want to buy the idea? Strategies for reaching and Attracting the target market including advertising, Promotions, Digital Market, Public Relations and Branding.
- **Operations** – how will the business work on a day-to-day basis?
- **Strategy** – medium and long-term strategic plans.

- **Financial Projections** – are the assumptions realistic (sales, costs, cash flow etc.)? Generally, a three-year period should be covered. Alternative scenarios, using different economic assumptions. Also state how much finance is required, what it will be used for and how and when the venture capitalist can expect to recover his investment?
- **Funding Requirements**: The amount of capital needed to start or grow the business and how it will be used
- **Executive Summary** – should be included at the beginning of the Business Plan. This is most important as it may well determine the amount of consideration the proposal will receive.
- **Appendix:** where supporting document are provided as additional document that provides further details or support the information in the business plan, such as resumes of key team members, Legal Document, Technical specifications contract, market research data, etc.

b) Conditions Required for regarding Capital market as efficient market

A market is generally regarded as efficient if the following are present:

1. Prices immediately reflect all relevant available information
2. No individual investor dominates the market: A diverse group of investors making decision based on available information helps in the swift incorporation of news into asset prices
3. Transaction costs are not too high to discourage trading
4. Homogeneous Expectations by all Investors regarding the future Performance of assets, Leading to Consensus on Pricing

The Efficient Market Hypothesis tests three degrees of efficiency

The efficient Market Hypothesis Posits that financial market are efficient if asset prices fully reflect all available information at any given time

EMH is categorised into three forms, each representing a different level of market efficiency

1. **Weak Form Efficiency**: Asset Prices reflect the information in past stock prices.

2**. Semi-strong Form Efficiency**: Asset Prices reflect past price information with all publicly available information.

3.**Strong Form Efficiency**: Asset Prices reflect past price information with all publicly available information and inside information

QUESTION FIVE

Marking Guide

		Details		Description	Marks	Total Marks
Q6	**a)**	Computation of Value of Geared Company	formula of Value of Ungeared company	Award 1 Mark	1	
			Value of Ungeared company	Award 1 Mark	1	
			formula of Value of Geared company	Award 1 Mark	1	
			Tax shield for interest on loan	Award 1 Mark	1	
			Value of Geared company	Award 1 Mark	1	
	b)	The required rate of return to shareholders of Geared company	Formula of Value of Equity of Geared Company	Award 1 Mark	1	
			Computation of Value of Equity of Geared Company	Award 1 Mark	1	
			Formula of Cost of equity of Geared Company	Award 1 Mark	1	
			Computation Cost of equity of Geared Company	Award 2 Mark	2	
	c)	Conditions for regarding Capital market as efficient and Three Form of Efficiency	i) Net Income Approach.	Award 2.5 Marks Well Explained Theary with their assumption and Grath	2.5	
			ii) Net operating Income Approach	Award 2.5 Marks Well Explained Theary with their assumption and Grath	2.5	
	d)	The effects of issuing these bonds to their	Miller and Modigliani Without Tax	Award 2.5 Marks Well Explained Theory	2.5	

		Details	Description	Marks	Total Marks
		Capital structure and to the Market value of KK Ltd.	Miller and Modigliani with Taxation	Award 2.5 Marks Well Explained Theory	2.5	
Total Marks					**20**

Model Answer

a) According to Miller and Modigliani with Tax implications, the value of any firm is established by capitalizing its expected net operating income where by

Value of Ungeared Company (Vu) $= \dfrac{(EBIT - iNTEREST)(1 - Tax)}{Keu}$

Value of Ungeared Company (Vu) $= \dfrac{(1,000,000 - 0)(1 - 30\%)}{0.2} =$ FRW **3,500,000**

Tax shield for Interest on loan = 1,000,000 * 30% = FRW 3**00,000**

Value of Geared= Value of Ungeared (Vu) + Tax shield on Interest on Loan

Value of Geared= 3,500,000 + 300,000 = FRW **3,800,000**

b) the required rate of return to shareholders of Geared company

Value of Geared company= Value of Equity + Value of Debt

Value of Equity of Geared Company = Value of Geared Company - Value of Debt

Value of Equity = 3,800,000 – 1,000,000= FRW **2,800,000**

Keg= Keu + (Keu-Kd) (1-tax)$\dfrac{Value\ of\ Debt}{Value\ of\ Equity}$

Keg= 20% + (20%-10%) (1-30%)$\dfrac{1,000,000}{2,800,000} =$ **22.5%**

c) i) THE NET INCOME APPROACH (NI)

According to this approach, the capital structure is relevant to the valuation of the firm. In other world a change in the capital structure leads to a corresponding change in overall cost of capital as well as the total value of the firm.

The essence of the NI approach is that the firm can increase its value or lower the overall cost of capital by increasing the proportion of debt in the capital structure.

The crucial assumption of this approach is:

1. there are no corporate taxes
2. the cost of debt is less than the cost of equity
3. the use of debt does not change the risk perception of the investor

The implications of these assumptions are that with constant Kd and Ke, increased use of debt, by magnifying the shareholder's earnings will result in a higher value of the firm via higher value of equity. The overall cost of capital will therefore decrease. If we consider the equation for the overall cost of capital,
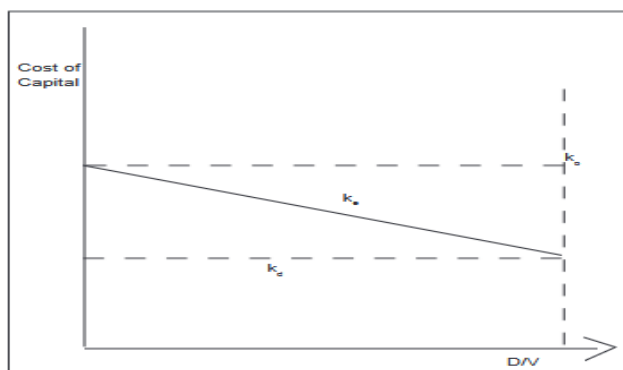

ii) NET OPERATING INCOME (NOI) APPROACH

According to this approach, Capital structure decision is irrelevant to the valuation of the firm. The market value of the firm is not at all affected by the capital structure changes. The change inn capital structure will not lead to any change in the in the total value of the firm and market prices of shares as well as the overall cost of capital.

The critical assumptions of this approach are:

1. the overall cost of capital remains constant
2. The market capitalizes the value of the firm as a whole.
3. Ko depends on the business risk. If the business risk is assumed to remain constant, then Ko will also remain constant.
4. The use of less costly debt increases the risk of the shareholders. This causes Ke to increase and thus offset the advantage of cheaper debt.
5. Kd is assumed to be constant.
6. Corporate income taxes are ignored.

The implications of the above assumptions are that the market value of the firm depends on the business risk of the firm and is independent of the financial mix
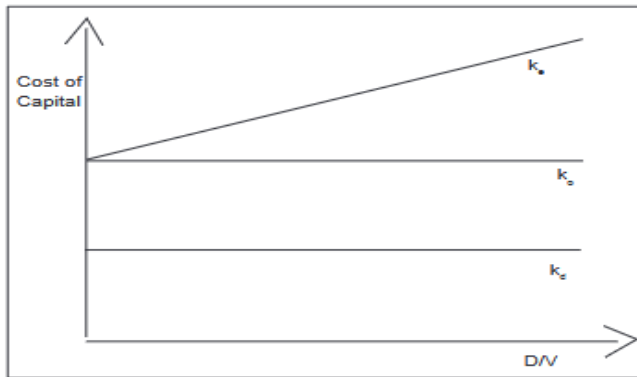
d) **Miller and Modigliani showed:** in perfect Capital market without corporate taxation, the replacement of expensive equity with cheaper debt did not decrease the Weighted Average Cost of capital, since the effect of adding in cheaper debts was exactly offset by the increase in cost of Equity.

In the absence of Tax, Miller and Modigliani's theory	States that	As Gearing Increases
Cost of Equity Increases	The Value of Company remain Constant	WACC also remain Constant

Miller and Modigliani with Taxation said that replacing equity with debt decreases the Weighted Average Cost of Capital (WACC), because of interest payments are very cheap as they are an allowance deduction for tax purposes. So, gearing up as much as possible would maximise the market values of the company and the CFO would be correct in believing that issuing traded bonds would decrease the WACC

When Corporation Tax is introduced, Miller and Modigliani's theory	States that	As Gearing Increases
Cost of Equity Increases	The Value of Company increases	As WACC Decrease and Projects NPV's rise

QUESTION SIX

Marking Guide

		Details	Description	Marks	Total Marks
Q5	**a)**	Cost of Equity.	0.5 Marks for Computation of Dividend, 0.5 Marks for Growth in Dividend, 0.5 for Formula of Cost of Equity,1.5 Marks for Computation of Cost of Equity	**3**	
	b)	Cost of redeemable debentures.	1 Mark for Computation of NPV for different DF (Maximum 2 Marks), 0.5 for Formula of IRR, 1.5 Marks for Computation of Cost of Redeemable debt	**4**	
	c)	Cost of Convertibles debentures	1 for Conversion Value, 1 Mark for Computation of NPV for different DF (0.5 Each), 1 Mark for Computation of Cost of Convertible debentures by IRR	**3**	
	d)	Cost of preferred stock.	0.5 Marks for Formula of Cost of Preference,1.5 Marks for Computation of Cost of Preferred Stock	**2**	
	e)	Weighted average Cost of Capital	1 Mark for updated Market Value of source of Finance, 2 Marks for Computation of WACC	**3**	
	f)	The Maximum Amount that Company could raise without Additional Issue of equity or Debt	1 Mark for Correct Computation	**1**	
	g)	Two where and how WACC Plays a pivotal role in making Financial Decision.	Award 0.5 Marks for outline, 1.5 Marks for Correct Explanation (Maximum Two Points)	**4**	
Total Marks					**20**

Model Answer

a)

Year	PAT Attributable to ordinary shareholder	Dividend Pay-out Ratio	Dividend Paid	Retention Amount as internal Generated Revenue
2020	3,000,000	50%	1,500,000	1,500,000
2021	3,840,000	50%	1,920,000	1,920,000
2022	4,120,000	50%	2,060,000	2,060,000
2023	4,900,000	50%	2,450,000	2,450,000
2024	5,240,000	50%	2,620,000	2,620,000
				10,550,000

Dividend Paid	**Number of Share issued**	**Dividend Per Share**
1,500,000	10,000	150
1,920,000	10,000	192
2,060,000	10,000	206
2,450,000	10,000	245
2,620,000	10,000	262

Ordinary Share in Issue = Ordinary share Capital / Nominal Value

Ordinary Share in Issue = RWF 10,000,000 / 1,000

Ordinary Share in Issue = 10,000 Shares

Growth rate in Dividend$= \sqrt[n]{\dfrac{Dividend\ in\ 2024}{Dividend\ in\ 2020}} - 1$

Growth rate in Dividend$= \sqrt[4]{\dfrac{262}{150}} - 1 = 1.15 - 1 = 0.15 = 15\%$

For Number of Period, we count Interval of growth not Number of Years

  i)

Cost of Equity $= \dfrac{Current\ Dividend\ (1+Growth)}{MPS\ ex-div}$ **+Growth**

MPS= Market value/number of shares

$$Ke = \frac{Do(1+g)}{MPS\ ex-div} + g = \frac{262(1+15\%)}{3350} + 15\% = \mathbf{24\%}$$

ii) Cost of Redeemable Debentures

Interest on Redeemable debt = Face value * Interest Rate

Interest on Redeemable debt = RWF 1,000 *10% = RWF 100

Interest after tax = RWF 1,000 *10% = RWF 100*(1-30%) = 70

For Redeemable debt we use Internal Rate of Return by Imposing different discounting rate as Trial-and-error Method

Year	Details	Cash flow	DF(10%)	PV	DF(15%)	PV
Year 0	Market Value	-800	1	-800	1	-800
Year 1-5	Interest(1-tax)	70	3.791	265.37	3.352	234.64
Year 5	Redemption Value	1000	0.621	621	0.497	497
	NPV			86.37		-68.36

$$\mathbf{IRR = LDF + (HDF-LDF)}\frac{NPV\ @\ LDF}{NPV\ @LDF - NPV\ @\ HDF}$$

$$\mathbf{IRR = 10\% + (15\% - 10\%)}\frac{86.37}{86.37 - (-68.36)} = \mathbf{12.8\%}$$

LDF= Lower Discount Factor

HDF= High Discount Factor

NPV @ LDF = Net present value @ Lower Discount Factor

NPV @ HDF = Net present value @ High Discount Factor

Alternatively

$$Kd = \frac{I(1-t) + \left[\frac{RV-CMV}{n}\right]}{\left[\frac{RV+MV}{n}\right]}$$

Where Kd is cost of redeemable debt

    I is interest [10%*1,000(1 – 0.3) = FRW 70]

    CMV is the current market value (FRW 800)

RV is the redemption value (FRW 1,000)

 t is tax rate (30%)

n is maturity period or number of years for the debt (5)

Interest = 10% * 1,000 = FRW 100

$$Kd = \frac{100(1-0.3)+\left[\frac{1,000-800}{5}\right]}{\left[\frac{1,000\ +\ 800}{2}\right]} = 12.2\%$$

iii) Cost of Convertibles Debentures

Po= Current Ex-dividend ordinary share price

G= is expected annual Growth of the ordinary share price

N= is the number of years to conversion

R= is the number of shares received on conversion

Conversion Value= [Po (1+g) ^n] * R

Conversion Value= [3,350 (1+10%) ^5] * 2= 10,790

Redemption value if conversion was not occurred= RWF 10,000 as par Value

IF Conversion Value is Greater than Redemption value, **we choose conversion**

Then we use internal rate of return to get Cost of convertible debentures

Year	Details	Cash flow	DF (10%)	PV	DF (15%)	PV
Year 0	Market Value	(8,200)	1	-8200	1	-8200
Year 1-5	Interest(1-tax)	560	3.791	2122.96	3.352	1877.12
Year 5	Conversion Value	10,790	0.621	6700.59	0.497	5362.63
	NPV			623.55		-960.25

$$IRR = LDF + (HDF-LDF)\frac{NPV\ @\ LDF}{NPV\ @\ LDF - NPV\ @\ HDF}$$

$$IRR = 10\% + (15\% - 10\%)\frac{623.55}{623.55 - (-960.25)} = 12\%$$

iv) Cost of Preferences share

Dividend paid to Preference shareholders = Nominal value * Dividend rate

Dividend paid to Preference shareholders = RWF 1,000 * 11%= 110

Don't forget that Tax relief is not given to Preferences share dividend Because Dividends to Preference shareholders are paid out from Profit after Tax

$$\text{Kp} = \frac{Dividend}{MPex-div} = \frac{110}{1,200} = 9\%$$

v) Weighted Average cost of Capital

SOURCES OF FINANCE	COST	Par Value	Number of shares	MPS / SHARE	Market Value
Ordinary share capital (FRW 1,000)	10,000,000	1,000	10,000	3,350	33,500,000
12% redeemable debentures (FRW 1,000)	3,000,000	1,000	3,000	800	2,400,000
8% Convertible Loan Note (RWF 10,000)	6,500,000	10,000	650	8,200	5,330,000
11% Preference share (FRW 1,000)	3,500,000	1,000	3,500	1,200	4,200,000
Total Market Value					45,430,000

SOURCES OF FINANCE	Market Value	Weighting	Cost of Each source of Finance	Weighting *Cost of each source of finance
Ordinary share capital (FRW 1,000)	33,500,000	74%	24%	18%
12% redeemable debentures (FRW 1,000)	2,400,000	5%	12.8%	1%
8% Convertible Loan Note (RWF 10,000)	5,330,000	12%	12%	1%
11% Preference share (FRW 1,000)	4,200,000	9%	9%	1%
	45,430,000			21%

WACC= 21%

$$\text{WACC} = \frac{Ke*VE}{VE+Vre+VCONV+Vpr} + \frac{Kr(1-tax)*VR}{VE+Vre+VCONV+Vpr} + \frac{Kconv(1-tax)*MV\ Conv}{VE+Vre+VCONV+Vpr} + \frac{Kp*MVP}{VE+Vre+VCONV+Vpr}$$

vi) Maximum amount to be raised without request for further loan

Company has dividend Pay-out ratio of 50% of Profit after tax attributable to ordinary shareholders, That's means that Part of 50% are retained in the business as sources of capital to company, that means that company are able to raise RWF 105,500,000 from Retention as below in table

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Year	PAT Attributable to ordinary shareholder	Dividend Pay-out Ratio	Dividend Paid	Retention Amount as internal Generated Revenue
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2024	5,240,000	50%	2,620,000	2,620,000
				10,550,000

vii) Application of Weighted Average cost of capital

Weighted average cost of Capital is used to assess cost of financing Company's operations through a mix of debt, equity and other capital sources, here are some key applications of WACC:

1. **Investment Decision: WACC** is used as discount factor when evaluating a project or investment in different Technics such as NPV, IRR, the future cash flow is discounted to determine whether the investment will generate returns higher than cost of capital and ensuring a positive return on investment.

2. **Valuation of Companies:** Under Discounted Cash flow techniques WACC is used to discount future cash flow to determine the fair value of a company. This help Investors and analysts assess whether a company is overvalued or undervalued based on its cost of Capital

3. **Optimum Capital Structure:** WACC is used to determine the optimal mix of debt and equity financing, company seek to minimize their WACC by balancing the cost of Debt (interest rates) with the cost of equity (Required return to shareholders by achieving to Lower WACC at different combination of Equity and debt in capital structures

4. **Merger and Acquisition:** WACC Helps in determining the fair value of the target company ensuring that the acquisition creates value for the shareholders of the acquiring company.

   The acquiring company also uses the WACC to assess whether the combined entity will generate sufficient returns to justify the cost of capital to providers of funds

5. **Risk Assessment:** WACC reflect the risk level of a company's capital structure. A company with a higher proportion of debt in its capital structure which is cheaper than equity may have a lower WACC but is also introduces more financial risk

   In order hand, A Company with higher proportion of equity may have a higher WACC but less financial risk

End of Marking Guide and Model Answers