CERTIFIED PUBLIC ACCOUNTANT
INTERMEDIATE LEVEL EXAMINATIONS

I1.1: MANAGERIAL FINANCE

DATE: THURSDAY 27, NOVEMBER 2025

MODEL ANSWER AND MARKING GUIDE

SECTION A

MARKING GUIDE

QUESTION ONE: Shora Wunguke (SW Ltd)	**Marks**
a) (i) Potential causes of Agency Problems between management and its lenders (1 Mark each, Maximum **3 Marks**)	3
ii. Way of solving Agency Problems between management and its lenders (0.5 Mark each, Maximum **2 Marks**)	2
iii. Two stakeholders and they inference (1 Mark each, Maximum 2 Marks)	2
Maximum Marks (7 Marks)	**7**
b) Modified payback period (Gakiriro Company Limited)	
Present values of cash flows (0.5 each, max 3.5)	3.5
Net Present Value (1 mark)	1
Comment	0.5
Formula of modified payback period	1
Computation of modified Payback period	2
Maximum Marks (8 Marks)	**8**
c) Asset replacement (Gakiriro Company Limited)	
i. Replace the asset with an identical one. We use Equivalent Annuity Cost (2 Marks)	**2**
ii. With relevant calculations, assess how frequently Gakiriro Co Ltd should replace its assets	
Calculation of PV of One Year cycle (0.5 Mark for each, **Max 1 Marks**)	1
Calculation of PV of Two-Year cycle (0.5 Mark for each, **Max 1.5 Marks**)	1.5
Calculation of PV of Three-Year cycle (0.5 Mark for each, **Max 2 Marks**)	2
Equivalent annuity cost (1 Mark for each cycle)	3
Decision of replacement cycle (0.5 Mark)	0.5
Maximum Marks on the question (10 Marks)	**10**
Total marks	**25**

Model Answer

QUESTION ONE

a) i) Three Possible causes of Agency Problems between Shora Wunguke Ltd's management and its lenders.

1. **On Assets/investment substitution side:** In this case, the shareholders and bond holders will agree on a specific project. However, this project may be substituted with a high-risk project whose cash flows have high standard deviation. This exposes the lender holders because the project collapse, they may not recover all the amount of money advanced.

2. **On Payment of High Dividends:**

The payment of high dividends will lead to low level of capital and investment thus reduction in the market value of the shares and the bonds (lenders). A firm may also borrow debt capital to finance the payment of dividends from which no returns are expected. This will reduce the value of the firm and bond.

3. **On the investment side:** This arises when management want to invest money in long term projects that will improve value of the firms but the lenders are reluctant that the projects can be failed and company defaults payment of debts to the lenders.

4. **Disposal of assets used as collateral for the debt in this**: In this case the lenders is exposed to more risk because he may not recover the loan extended in case of liquidation of the firm.

5. **Borrowing more debt capital:** A firm may borrow more debt using the same asset as collateral for the new debt. The value of the old bond or debt will be reduced if the new debt takes a priority on the collateral in case the firm is liquidated. This exposes the first bondholders/lenders to more risk.

ii) <u>Advise how the problems in (a) can be reduced</u>

1. **Restrictive Bond/Debt Covenant**: In this case, the debenture holders (bond holders) will impose strict terms and conditions on the borrower. These restrictions may involve:

a. No disposal of assets without the permission of the lender.
b. No payment of dividends from retained earnings.
c. Maintenance of a given level of liquidity indicated by the amount of current assets in relation to current liabilities.
d. Restrictions on mergers and organizations.
e. No borrowing of additional debt, before the current debt is fully serviced/paid.
f. The bondholders may recommend the type of project to be undertaken in relation to the riskiness of the project.

2. **Callability Provisions:** These provisions will provide that the borrower will have to pay the debt before the expiry of the maturity period if there is breach of terms and conditions of the bond covenant.
3. **Transfer of Asset**: The bondholder or lender may demand the transfer of asset to him on giving debt or loan to the company. However, the borrowing company will retain the possession of the asset and the right of utilization. On completion of the repayment of the loan, the asset used as a collateral will be transferred back to the borrower.
4. **Representation: The lender or bondholder** may demand to have a representative **in the board of directors** of the borrower who will oversee the utilization of the debt capital borrowed and safeguard the interests of the lender or bondholder.
5. **Refuse to lend if the borrowing company has been involved in unethical practices** associated with the debt capital borrowed, the lender may withhold the debt capital. Hence, the borrowing firm may not meet its investment needs without adequate capital. The alternative to this is to charge high interest on the borrower as a deterrent mechanism.
6. **Convertibility**: In the event of breach of bond covenants, the lender may have the right to convert the bonds into ordinary shares so, they can be on annual meeting to make decision based on their interest

iii) Discuss possible motivations of different stakeholders towards the company (two stakeholders of choice)

The main stakeholders and their influence to the company are:

1. Shareholders-: are providers of capital of a company and their goal will be to maximize the wealth which that they have as a result of the ownership of the shares in the company.
2. Loan Creditors seek security, repayment of loan interest and principal.
3. Employees seek fair wages, promotional opportunities, welfare & social facilities => improved motivation.
4. Management seeks to ensure for their job security, fair reward, and job satisfaction.
5. Trade Creditors ensure payment within credit terms.
6. The Community looks for sponsorship, charities, install environmental measures.
7. The Government looks for receiving of taxes, rates, provide employment.
8. Customers looking for - provision of quality of service/goods at fair price, and on time etc.

b) **Answer**

Details	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Years 5**	**Year 6**
Pre-tax Cash flows		305,000	370,000	320,000	290,000	150,000	
Tax paid one year in arrear			(91500)	(111000)	(96000)	(87000)	(45000)

Details	Year 0	Year 1	Year 2	Year 3	Year 4	Years 5	Year 6
After tax cash flows		305,000	278,500	209,000	194,000	63,000	-45,000
Initial out flow	(900,000)						
Scrap value						100,000	
Working capital	(100,000)					100,000	
Tax saving			67,500	50,625	37,969	28,477	55,430
Cash flows	(1,000,000)	305,000	346,000	259,625	231,969	291,477	10,430
Discount factor (8%)	1.000	0.926	0.857	0.794	0.735	0.680	0.630
PV of Cash Flows	(1,000,000)	282,430	296,522	206,142	170,497	198,204	6,571
NPV Cumulative Present values of cash flows	160,366 (1,000,000)	(717,570)	(421,048)	(214,906)	(44,409)	153,795	160,366

Project have Positive NPV, I will accept the Project

WARKING 1

Tax on pretax cash flow

Tax rate (30%)	Before Tax Cash flow	Tax to pay
Year 1	305,000	91,500
Year 2	370,000	111,000
Year 3	320,000	96,000
Year 4	290,000	87,000
Year 5	150,000	45,000

Tax is paid one year in arears

Working 2

Cost	Tax rate	Tax Depreciation Allowable	Tax rate	Tax Shield (saving)
900,000	0.25	225,000	30%	67,500
675,000	0.25	168,750	30%	50,625
506,250	0.25	126,563	30%	37,969
379,688	0.25	94,922	30%	28,477
284,766	0.25	184,766	30%	55,430

Cost	Tax rate	Tax Depreciation Allowable	Tax rate	Tax Shield (saving)
(100,000)				

For last year, you take balance carried down and deduct scrap value figure will be tax allowable depreciation, so tax saving will be calculated on that figure.

Working 3: Payback period Calculation

Modified payback period = $Year\ before\ modified\ payback\ period\ occurs + \frac{Cummulative\ cash\ flow\ in\ year\ before\ recovery}{Modified\ cash\ flow\ in\ year\ after\ recovery}$

Modified Payback period = $4 + \frac{1,000,000-955,591}{198,204} * 12$ **= 4years 2 month**

Answer For C

c) i) **Method used when you want to replace to the existing asset with similar asset**

When an asset is being replaced with an identical asset, we use Equivalent Annual Cost method (EAC). Where optimum replacement cycle is calculated, the NPV of cost of buying and using the asset over its life cycle is converted into an equivalent annual cost. The least-cost replacement cycle is the one with the lowest equivalent annual cost.

ii. With relevant calculation, assess how frequently GAKIRIRO LTD the asset should be replaced their asset.

REPLACEMENT CYCLE in ONE Years		
Details	**Year 0**	**Year 1**
Initial investment	-5,000,000	
operating cost		-500,000
resale value		3,500,000
Total cashflow	-5,000,000	3,000,000
Discount Factor (8%)	1	0.926
Present value	**(5,000,000)**	**2,778,000**
NPV	**(2,222,000)**	

EAC for cycle 1= (2,222,000)/0.926 **= (2,399,568)**

REPLACEMENT CYCLE in **TWO** Years			
Details	**Year 0**	**Year 1**	**Year 2**
Initial investment	-5,000,000		
operating cost		-500,000	-700000
resale value			2,500,000

Total cashflow	**-5,000,000**	**-500,000**	**1,800,000**
Discount Factor (8%)	1	0.926	0.857
Present value	**(5,000,000)**	**(463,000)**	**1,542,600**
NPV	**(3,920,400)**		

EAC for cycle 2= (3,920,400)/1.783 = **(2,198,766)**

REPLACEMENT CYCLE in Three Years				
Details	**Year 0**	**Year 1**	**Year 2**	**Year 3**
Initial investment	-5,000,000			
operating cost		(500,000)	(700,000)	(1,000,000)
resale value				1,500,000
Total cashflow	**-5,000,000**	**-500,000**	**-700,000**	**500,000**
Discount Factor (8%)	1	0.926	0.857	0.794
Present value	**(5,000,000)**	**(463,000)**	**(599,900)**	**397,000**
NPV	**(5,665,900)**			

EAC for cycle 3= (5,665,900)/2.577 = **(2,198,642)**

Equivalent annual cost = the PV of cost over one replacement cycle / the cumulative PV factor for Number of years in cycle

Asset has to be replaced every three years, where the least-cost replacement cycle is the one with the lowest equivalent annual cost equal (2,198,642).

QUESTION TWO

MARKING GUIDE	**Marks**
Marking (Tech Solution Company Ltd)	
a)	
Factors influencing dividend policy (0.5 marks for listing and 0.5 marks for explanation, Maximum 6 Marks)	6
Maximum marks	**6**
b) Analyzing of payout of the Tech solution	

Formula for EPS	0.5
Computation of EPS (0.5 Marks for each year)	2.5
Formula of Dividend Payout ratio	0.5
Computation of dividend payout ratio (0.5 Marks for each year)	2.5
Computation of Growth rate Earnings per share	1
Comment on calculation (1 Marks)	1
Maximum marks	**8**
c) Dividend Policy used by Tech Solution	
(0.5 Marks for each comparison of remaining earnings and total dividend paid, Maximum 4 marks)	2.5
Comment for calculation and say it is a residual dividend policy	1.5
Advantages of dividend policy used (1 mark, Maximum 2 Marks)	2
Maximum marks	**6**
Total Marks	**20**

QUESTION TWO

Answer

a. **Briefly discuss six factors to be considered in formulating Tech Solution Company Ltd's dividend policy**

When deciding on the dividend to pay out to shareholders, one of the main considerations of the directors will be the amount of cash they wish to retain to meet financing need as well as future financing requirement. **There are a number of practical considerations which a company must take into account in setting its particular dividend policy:**

1. **The company's Liquidity position:** Cash is needed to pay dividends because Profits do not equal cash. The level of corporate liquidity might influence dividend payouts.
2. **The effect of Inflation**: many shareholders like dividend to increase by at least as much as inflation, in periods of high inflation shareholders require increased dividends in order to maintain their purchasing power while companies may have to retain funds in order to maintain their existing operating capability.
3. **Taxation**: If shareholders pay high marginal rates of Income Tax, they may prefer low dividends. If subject to low tax rate or zero tax, they may prefer high dividends.
4. **Transaction Costs**: Some shareholders may depend on dividends. If earnings are retained, they can create "home-made" dividends by selling some shares (capital). However, this may be inconvenient and costly (brokerage fees etc.)
5. **Legal Restrictions**: Dividends can only be paid out of realized profits. Past losses must first be made good.

6. **Control**: If high dividends are paid the company may subsequently require capital and this may be obtained by issuing shares to the market for new shareholders. This may result in a dilution of control for existing shareholders
7. **Stable Dividends**: Generally, shareholders require a stable dividend policy and hopefully, steady dividend growth
8. **Investment Opportunities**: "Residual Theory" retain sufficient funds until all profitable investments (those with a positive NPV) have been funded. Balance to be paid as dividends. Drawback is that dividends may vary dramatically from year to year. Also, consider the timing of the cash flows from the investments as these will be required to pay future dividends.
9. **The company gearing level**: If the company is highly geared it may have little option but to retain. Retentions will build up the equity base, thus reducing gearing and assisting future borrowing. Certain types of company (e.g., small/unquoted) may not have access to external funds and may need to retain.
10. **Cost of New Finance**: The costs associated with raising new equity/debt can be quite high. If debt is raised interest rates may be high at that particular point in time.
11. **Information Content**: The declared dividend provides information to the market about the company's current performance and expected future prospects. An increase or a reduction will be reflected in the share price.
12. **Existing Debt:** Restrictive covenants in existing loan agreements may limit the dividend payout or prohibit the company from arranging further borrowing. Existing debt which may be due for repayment will require funds and may cause a reduction in the level of dividend.\

13. **Perceived Risk:** The earnings from retained dividends may be perceived as being a riskier return than actual cash dividends, thereby causing their perceived value to be lower (the "Bird in the Hand Theory").

b. Discuss whether or not the shareholder's criticism is likely to be valid

Details	**2017**	**2018**	**2019**	**2020**	**2021**
After tax earnings (FRW)	3,400,000	3,900,000	5,100,000	5,900,000	8,020,000
Number of ordinary shares	10,000	12,000	13,000	15,000	18,000
Working 1					
EPS	340	325	392	393	446

Dividend per share (FRW)	90	80	85	85	93
EPS	**340**	**325**	**392**	**392**	**390**
Working 2					
Dividend payout ratio	**26%**	**25%**	**22%**	**22%**	**21%**

Details	**2017**	**2018**	**2019**	**2020**	**2021**

After tax earnings (FRW)	3,400,000	3,900,000	5,100,000	5,900,000	8,020,000
Dividend per share (FRW)	90	80	85	85	93
Number of ordinary shares	10,000	12,000	13,000	15,000	18,000
Average share price (FRW)	150	175	150	160	200
Capital expenditure Required per year	2,500,000	2,940,000	3,995,000	4,625,000	6,346,000

Growth of EPS $= 4\sqrt{\frac{446}{340}} - 1 = 7\%$

Dividend payout ratio $\frac{DPS}{EPS}$

EPS $= \frac{\text{after tax earning}}{\text{Number of ordinary shares}}$

The company earning per share was increased by growth rate of 7% from FRW 340 to FRW 446, this can be supported by different factors such as new investment leakage in the business by new shareholders to finance profitable project which make rise of Earning of the business from FRW3.4 million to FRW8.02 million in previous 5 years but company's dividend payout ratio is decreases overtime from 26% up to 21%, during the last five years That show a fluctuation of DPS.. Therefore, The Criticisms of the shareholders tend to be valid, the company has to Search for a way to solve this problem.

c. Identify and discuss briefly the type of Dividend policy used by Tech Solution Company Ltd and the relative advantages of those policies.

Details	**2017**	**2018**	**2019**	**2020**	**2021**
After tax earnings (FRW)	3,400,000	3,900,000	5,100,000	5,900,000	8,020,000
Capital expenditure Required per year	2,500,000	2,940,000	3,995,000	4,625,000	6,346,000
Remain earning after financing Capital expenditure required for each year	**900,000**	**960,000**	**1,105,000**	**1,275,000**	**1,674,000**

Dividend per share (FRW)	90	80	85	85	93
Number of ordinary shares	10,000	12,000	13,000	15,000	18,000
Total dividend	**900,000**	**960,000**	**1,105,000**	**1,275,000**	**1,674,000**

When you look on above Calculation Tech solution company LTD pay excess all cash flow after financing Capital expenditure requirement for each year as Dividend to shareholders, this means

that all spare cash must be either reinvested in the business or redistributed among the shareholders. (This is a residual dividend Policy)

Residual dividend theory: Under this theory, a firm will pay dividends from residual earnings i.e. earnings remaining after all suitable projects with positive NPV has been financed. It assumes that retained earnings is the best source of long-term capital since it is readily available and cheap.

Advantages of Residual Theory

1. **Saving on floatation costs** No need to raise debt or equity capital since there is high retention of earnings which requires no floatation costs.
2. **Avoidance of dilution of ownership new equity issue would dilute ownership and control**. This will be avoided if retention is high. A high retention policy may enable financing of firms with rapid and high rate of growth.
3. **Tax position of shareholders** High-income shareholders prefer low dividends to reduce their tax burden on dividends income. They prefer high retention of earnings which are reinvested, increase share value and they can gain capital gains which are not taxable when there are in economy where captain gain is exempted. This is done by different Government to encourage company to invest retained earnings as growth opportunity

QUESTION THREE

INYANGE Ltd and ZIRAKAMWA MEZA Ltd

Marking Guide	**Marks**
a) Calculations	
1. Inflating each figure of sale for Each Year (0.5 Marks, 2.5 Max)	2.5
2. Inflating each figure of cost of sale for Each Year (0.5 Marks, 2.5 Max)	2.5
3. Inflating each figure of administration cost (0.5 Marks, 2.5 Max)	2.5
4. Inflating each figure of the Distribution cost (0.5 Marks, 2.5 Max)	2.5
5. Tax saving on capital allowance (2.5 Marks)	2.5
6. Sum PV of cashflow of 5 years' Time Horizon	0.5
6. Terminal value (1 Marks)	1
7. Value of market capitalization of firm (1 mark)	1
Total Marks	**15**

Detailed Answer

ANSWER

	2023	**2024**	**2025**	**2026**	**2027**	**2028**
Nominal terms	**'FRW'000**	**''FRW'000**	**'FRW'000**	**'FRW'000**	**'FRW'000**	**'FRW'000**
Sales	**42,000**	**55,125**	**64,827**	**80,223**	**89,340**	
Cost of sales	**(15,450)**	**(18,035)**	**(24,040)**	**(20,259)**	**(23,185)**	
Gross Profit	26,550	37,090	40,787	59,964	66,155	
Distribution Cost	**(4,080)**	**(5,202)**	**(4,457)**	**(3,788)**	**(4,306)**	
Administration Cost	**(3,060)**	**(3,121)**	**(3,184)**	**(3,247)**	**(3,312)**	
EBIT	19,410	28,767	33,146	52,929	58,537	
Interest Paid	(6,800)	(6,800)	(6,800)	(6,800)	(6,800)	
PBT	12,610	21,967	26,346	46,129	51,737	
Tax Paid	-	(3,783)	(6,590)	(7,904)	(13,839)	(15,521)
Tax shield on Capital allowance	-	**18,000**	**5,625**	**5,625**	**5,625**	**5,625**
cash flow	12,610	36,184	25,381	43,850	43,523	-9,896
Discounting factor (10%)	0.909	0.826	0.751	0.683	0.621	0.564
PV	11,462	29,888	19,061	29,950	27,028	-5,581

PV (first 5 years) =111,808,000

Terminal value

PV (after 5 years) = {27,028,000* 1.03/ (0.1-0.03)} * 1.1^-5 = 246,970,000
Market capitalization value = FRW 111,808,000+FRW 246,970,000 = FRW <u>358,778,000</u>

WORKING

Tax allowable depreciation	60,000	18,750	18,750	18,750	18,750
Tax rate	0.3	0.3	0.3	0.3	0.3
Tax saving	**18000**	**5625**	**5625**	**5625**	**5625**

Accounting depreciation is not a relevant cash flow, so it was not considered in business valuation under the discounted cash flow method. **Inflation rate is applied in this order: Sales revenue: 5%, cost of sale: 3%, and distribution cost & administration cost: 2%.**

Working 1						
		2023	**2024**	**2025**	**2026**	**2027**
Sale in Current Terms		40,000	50,000	56,000	66,000	70,000
Inflation rate	5 %	1.05	1.1025	1.157625	1.21550625	1.27628156
Inflated sale		**42,000**	**55,125**	**64,827**	**80,223**	**89,340**

Working 2						
		2023	**2024**	**2025**	**2026**	**2027**
COS in Current Terms		15,000	17,000	22,000	18,000	20,000
Infration rate	3 %	1.03	1.0609	1.092727	1.12550881	1.15927407
Inflated sale		**15,450**	**18,035**	**24,040**	**20,259**	**23,185**

Working 3		**2023**	**2024**	**2025**	**2026**	**2027**
Distubution cost in Current Terms		4,000	5,000	4,200	3,500	3,900
Infration rate	2 %	1.02	1.0404	1.061208	1.08243222	1.1040808
Inflated sale		**4,080**	**5,202**	**4,457**	**3,789**	**4,306**

Working 4		**2023**	**2024**	**2025**	**2026**	**2027**
Administration cost in Current Terms		3,000	3,000	3,000	3,000	3,000
Infration rate	2 %	1.02	1.0404	1.061208	1.08243222	1.1040808
Inflated sale		**3,060**	**3,121**	**3,184**	**3,247**	**3,312**

SECTION B

QUESTION FOUR: ROBOTIC SOLUTION CO LTD

Marking Guide	Marks
a)	
i. Calculations	
1. Cost of equity (0.5 mark for formula, 1 Mark for calculation)	**1.5**
2. Cost of irredeemable (0.5 Mark for formula, 1 Mark for calculation)	1.5
3. Conversion value of convertible debt	1
Cost of convertible loan note by trial-and-error method (IRR)	3
WACC (Formula 0.5, Computation 0.5, Final Answer 0.5)	1.**5**
ii. briefly states three constraints of applying that method in estimating cost of equity (1 Mark for each constraint, Max 3)	**3**
iii. Capital Asset pricing Model would be used as alternative method of estimating the cost of capital	
Explanation of CAPM and risk associated to the model	**1**
Formula of CAPM	**1**
b)	
i. constraint of venture capital in Rwanda (0.5 each max 2.5)	2.5
ii. Outline three reasons for growth in ventures capital in developed country (0.5 Mark for each, Max 1.5)	1.5
iii. Five stages of investment by a venture capitalist (0.5 Mark for each).	2.5
Total Marks	**20**

QUESTION FOUR

Answer for a

1. **calculate: Cost of equity**

Ke = $\frac{Do(1+g)}{MPS} + g$

Ke= $\frac{200(1+0.05)}{1500} + 0.05 = 19\%$

Cost of equity is 19%

Ke = Cost of equity

Do= Dividend in current year (FRW 200)

Po= Current market price of share (FRW 1500)

G = Annual dividend growth (5%)

2. **Cost of irredeemable loan note**

10% Irredeemable loan note (FRW 1000)

Interest rate = 10% *1000

=100

Market price 900

Cost of irredeemable loan note = $\frac{INTERECT*(1-TAX)}{Market\ Price\ of\ irredemable\ debt}$

$= \left(\frac{100*(1-0.3)}{900}\right) * 100\% \quad = \quad 7.78\%$

3. Cost of convertible loan note

Conversion value= [Po(1+g) ^n] *(number of shares to be received in conversion)

= [1500*(1+0.06) ^5] * 4 = **FRW 8,029**

Redeemable value at nominal value = 10,000

As the redemption value is FRW 10,000 is greater than value of conversion so, Investor would choose redemption.

We use IRR for the calculation of the cost of convertible debt by trial-and-error method.

year	details	Cash flow 'FRW'	Discount factor (5%) (a)	Present Value 'FRW'	Discounted facto (10%) (b)	Present Value'
0	Market value	(8,000)	1	(8,000)	1	(8,000)
1-5	Interest [1,200*(1-0.3)]	840	4.329	3,636.36	3.791	3,184.44
5	Redemption value at par	10,000	0.784	7,840	0.621	6,120
	NPV		**3,476.36**			**1,394**

Interest = 12%*10,000 = FRW 1,200

IRR = $a + (\frac{NPV\ @\ a}{NPV\ @\ a - NPV\ @b})$* (b-a)

IRR = $5\% + (\frac{3,476.36}{3,476.36-1,394)}$* (10%-5%) **= 13.35%**

Cost of convertible debt is 13.35%

4. Weighted average cost of capital

- Ke =19%

Market value of equity= $(\frac{15,0000}{1,000})$*1,500 = FRW 22,500

- Cost of irredeemable loan note= 7.78%

Market value = $(\frac{35,000}{1,000})$*900 = FRW 31,500

- Cost of convertible debt is 13.35%

Market value = $(\frac{40,000}{1,0000})$*8,000 =32000

WACC=$(\frac{MV\ E}{MV\ E+MV\ R+MV\ CONV})$*Ke+$\frac{MV\ \ reedemable}{MV\ E+MV\ R+MV\ Convertible})$ *
$K\ r$+$(\frac{MV\ \ irr}{MV\ E+MV\ r+mv\ CONV})$* K convertible

WACC = [22,500 / (22,500+31,500+32,000)] * 19% + [31,500 / ((22,500+31,500+32,000)] * 7.78% + [32,000 / (22,500+31,500+32,000)] * .13.35%
WACC = 4.97% + 2.85% + 4.97%
WACC = 13%

Tabular Format

Details	Cost of source of Finance	Per Value	Nber of share	MPS	Total Market Value	Weighting	Cost of each sources of Finance	W * Cost of Finance
Ordinary share	15,000	1,000	15	1500	22,500	0.261628	19%	5%
10% Irredeemable Loan Note	35,000	1,000	35	900	31,500	0.366279	8%	3%
12% Convertible	40,000	10,000	4	8000	32,000	0.372093	13.35%	5%
	90,000				**86,000**			**13%**

ii) The dividend growth model is one of the methods of estimating the cost of equity, where the assumption is that the market value of a share is directly related to the expected future dividend from the shares. **Elaborate three constraints of applying that method in estimating cost of equity.**

- It does not produce meaningful results where no dividend is paid, in order world if Dividend is zero (0), Cost of equity (Ke) will be zero.
- No allowance is made for the effects of taxation, the model can be modified to incorporate tax
- Dividend do not grow smoothly in reality, g is only approximation
- The model fails to take capital gain into account

- It assumes that there are no issue costs for new shares.
- The model does not explicitly incorporate risk

iii) Explain how the Capital Asset Pricing Model would be used as an alternative method of estimating the cost of capital, and indicate what information would be required.

The CAPM model provides an alternative to the dividend valuation model in calculating the cost of equity. The CAPM model seeks to differentiate between the various types of risk faced by the company and allows for the fact that new projects undertaken may carry a different level of risk from the existing business.
The model focuses on the level of **systematic risk** attaching to the firm, in other words, the elements of risk which is common to all investments and cannot be avoided by diversification.

CAPM Model uses the **Beta factor** as a measure of an individual share's volatility of expected return as against the market average.
Formula of the model
Expected return E(r)= Risk free rate + beta factor (market return - Risk free rate)

Answer for b (question 4)

i. Briefly State Five constraint of venture capital in Rwanda?

- Lack of rich investors in Rwanda, hence inadequate equity capital.
- Inefficiencies of stock market: financial information available to Rwanda Stock Exchange is inefficient and investors cannot sell the shares in future.
- Prices do not reflect all the available information in the market.
- Infrastructural problems: this limits the growth rate of small firms which need raw materials and unlimited access to the market factors of production.
- Lack of managerial skills on part of venture capitalists and owners of the firm.
- Nature of small business in Rwanda. There are 3 categories. a. Large MNC – these are established firms and can raise funds easily. b. Asian owned small businesses – They are family owned hence do not require interference of venture capitalists because they are not ready to share profits. c. African – owned business – need venture capital but have little potential for growth
- Focus on low-risk ventures e.g confining to low technology, low growth sectors with minimum investment risks.
- Conservative approach by the venture capitalists.
- Delay in project evaluation e.g months or more hence entrepreneurs' loose interest in the project.
- Lack of government support and inefficient financial system.

ii. Outline three reasons for growth in ventures capital in developed country

- Public attitude i.e., a favorable attitude by the public at large towards entrepreneurship, success as well as failure.
- Dynamic financial system e.g., efficient stock exchange and a competitive banking system.
- Government support like taxation system to encourage venture capital e.g. tax concessions and investment allowance taxes in finance industry
- Growth in the number of Management buyer-outs (MBO) which have created a demand for equity finance.
- Establishment of venture capital institutions e.g., investors in the industry.

- **Stages of Venture Capitalist investment**

1. Seed Capital

Finance provided to enable a business concept to be developed, perhaps involving production of prototypes and additional research, prior to bringing the product to market**.**

2. Business start-ups

When a business has been set up by someone who has are put time and money, ventures capitalist may be willing to provide finance to enable it to get off the ground.

3. Business development

When a company want to expand their market, Venture's capitalist can provide development capital to invest in new product or new market.

4. Management buy-out

A management buyout is the purchase of all or parts of a business from its owners by its managers

5. Management Buy-in (MBI)

Venture's capitalist provided funds to enable a manager or group of managers from outside the company to buy into the company

QUESTION 5

MARKING GUIDE

Question	Criteria	Marks
Q5 (a)	✓ Award **0.5 Marks** for each correct yearly Sale	2
	✓ Award **0.5 Marks** for each correct yearly material cost	2
	✓ Award **0.5 Marks** for each correct yearly labour cost	2
	✓ Award 0.5 Mark for Tax on Cashflow	2
	✓ Award 0.5 **Marks** for each correct tax saving	2
	✓ Award **0.5 Marks** for each correct Initial Investment Award	0.5
	✓ Award **0.5 Marks** for each correct yearly Present Value	2
	✓ Award 0.5 Marks for correct NPV with Recommendation	0.5
	Maximum marks	**13**

Question	Criteria	Marks
Q5 (c)	✓ Award 2 **Marks** for Keza Restaurant Ltd (KKR) relevant cash flow and its correct NPV ✓ Award 2 **Marks** for Keza Bar Services Ltd (KBS) relevant cash flow and its correct NPV ✓ Award 1 **Mark** for correct recommendation **Maximum marks**	2 2 1 **5**
Q5 (3)	Award 1 Mark for each of the two listed elements to be considered in a **business plan** before deciding whether an investment is worth backing the venture capital.	2
Total		**20**

MODEL ANSWERS

(a) Evaluate if the proposed project using Net Present Value (NPV), state if it will be accepted or rejected and why?

Calculation of NPV to handle different inflation rat

		Year 0	Year1	Year 2	Year3	Year4
Sale Revenue			285,000,000	285,000,000	285,000,000	285,000,000
1. Raw Material	5%		(49,527,600)	(52,003,980)	(54,604,179)	(57,334,388)
2. Labour Cost	4%		(26,573,300)	(27,636,232)	(28,741,681)	(29,891,349)
Total Cost of Sale			**(76,100,900)**	**(79,640,212)**	**(83,345,860)**	**(87,225,736)**
Gross Profit			208,899,100	205,359,788	201,654,140	197,774,264
Tax	30%		(62,669,730)	(61,607,936)	(60,496,242)	(59,332,279)
Tax saving of TAD			72,000,000	36,000,000	36,000,000	36,000,000
Initial Investment		-600,000,000				
Total Cashflow		**(600,000,000)**	**218,229,370**	**179,751,852**	**177,157,898**	**174,441,984**
DF(15)		1	0.870	0.756	0.658	0.572
PV of Cashflow		(600,000,000)	189,859,552	135,892,400	116,569,897	99,780,815

		Year 0	Year1	Year 2	Year3	Year4
NPV		(57,897,336)				

Project will be rejected because it has Negative NPV

Working on Tax Saving

Detail	Amount (FRW)	Tax rate	Tax saving	Year
Initial investment	600,000,000			
Capital Allowance @40%	(240,000,000)	30%	72,000,000	1
Balance b/d	360,000,000			
Capital Allowance @	(120,000,000)	30%	36,000,000	2
Balance b/d	240,000,000			
Capital Allowance @25%	(120,000,000)	30%	36,000,000	3
Balance b/d	120,000,000			
Capital Allowance @25%	(120,000,000)	30%	36,000,000	4
Scrap value	-			

(b) Calculate the relevant cash flows for both KKR and KBS projects

Project KKR: Keza Restaurant (KKR)

Year	Amount (FRW)	DF@15%	PV
0	(100,000,000)	1.000	(100,000,000)
1	35,000,000	0.870	30,450,000
2	35,000,000	0.756	26,460,000
3	35,000,000	0.658	23,030,000
4	35,000,000	0.572	20,020,000
5	35,000,000	0.497	17,395,000
NPV			**17,355,000**

Project should be accepted as it has a + NPV

Project KBS: Keza Bar Services (KBS)

Year	Amount (FRW)	DF@15%	PV
0	(100,000,000)	1.000	(100,000,000)
1	30,000,000	0.870	26,100,000
2	30,000,000	0.756	22,680,000
3	30,000,000	0.658	19,740,000
4	30,000,000	0.572	17,160,000
5	30,000,000	0.497	14,910,000
6	30,000,000	0.432	12,960,000
NPV			**13,550,000**

Project should be accepted as it has a + NPV

Alternatively, you can use Annuity Factor
Project KKR: Keza Restaurant (KKR)

Year	Details	Cashflow	DF (15%)	PV
0	Initial Invest	(100,000,000)	1	(100,000,000)
1 to 5	Cash inflow	35,000,000	3.352	117,320,000
	NPV			**17,320,000**

Alternatively, you can use Annuity Factor
Project KBS: Keza Bar Services (KBS)

Year	Details	Cashflow	DF (15%)	PV
0	Initial Invest	(100,000,000)	1	(100,000,000)
1 to 5	Cash inflow	30,000,000	3.784	113,520,000
	NPV			**13,520,000**

Recommendation:
Agaciro Kacu Keza Ltd (AKK) will go with the project of Keza Restaurant Ltd (KKR) because it is the one higher NPV.
Note:
"Since both projects has a Positive NPV and project are mutually exclusive, you choose one with the highest NPV

(c) 2 elements to be considered in a business plan before deciding whether an investment is worth backing the venture capital:

1. **Product/Service:** what is unique about the business idea?
2. **Management Team:** can the team run and grow a business successfully?
3. **Financial Projections:** are the assumptions realistic (sales, costs, cash flow etc.)?
4. **Industry:** what are the issues, concerns and risks affecting the business area?
5. **Market Research:** do people want to buy the idea?
6. **Operations:** how will the business work on a day-to-day basis?
7. **Strategy:** medium and long-term strategic plans.

QUESTION SIX

MARKING GUIDE

Q6	Criteria	Marks
a)	✓ Award 1 **Mark** for calculation of annual demand ✓ Award **1 Mark** for Formula of EOQ ✓ Award **1 Mark** for correct answer of EOQ	1 1 1
a) (ii)	✓ Award 1 Mark for calculation of Annual Production ✓ Award 2 Marks for Formula of EBQ ✓ Award 1 Mark for correct answer of EOQ	1 1 2
a) (iii)	Award 1 **Mark** for each of 3 challenges of using just in time **Maximum marks**	**3** **10**
b)	Award **1 Mark** for the definition of efficient portfolio	**1**
(c) (i)	Award **1 Mark** for the computation of weights for each company Award **1 Mark** for the Formula of portfolio return Award **1 Mark** for the correct answer	2 1 1
c) (ii)	 Award 2 **Marks** for the Formula of portfolio risk Award 3 **Mark** for the correct answer **Maximum marks**	 **2** **3** **9**
	Total marks	**20**

MODEL ANSWER

a)

i)

Calculate economic order quantity	
Annual demand (D) FRW 40M/2,000	**20,000 units**
Holding cost Cho	200
Ordering cost CO	500

$$\textbf{EOQ}= \sqrt{\frac{2*D*Co}{Cho}} = \sqrt{\frac{2*20{,}000*500}{200}} = \mathbf{316}$$

D= Annual Demand

Co= Ordering Cost
Cho= Holding Cost

ii)

S = Setup cost per batch	300
D = Annual demand	20,000
H = Holding cost per unit per year	200
P = Production rate (units/year)	30,000
d=D = Demand or usage rate (units/year)	20,000

Production per Day	120
Number of days Operate Per Year	250
Annual Production	**30,000**

$$\textbf{EBQ}= \sqrt{\frac{2*S*D}{Cho}} * \frac{P}{P-D} = \sqrt{\frac{2*300*20{,}000}{200}} * \frac{30{,}000}{30{,}000-20{,}0000} = \textbf{424 Unit}$$

iii)

1) It relies on efficient and timely delivery of materials any disruption in supply chain can halt production and lead to running of stock

2) Change in customers demand is hard to manage where a sudden increase in customers demand may not be satisfied leading to dissatisfied customers

3) High cost of implementation hence requires huge capital investment

b)

- An efficient portfolio is a portfolio that lies along the efficient frontier curve. This portfolio is measured on the basis of risk and return.
- It has a positive correlation between risk and return. The higher the risk the higher is the return and the lower the risk the lower its return
- An efficient portfolio is well diversified and combines various asset in such a way that the overall risk is minimized for a given level of return
- The expected return of an efficient portfolio is the weighted average of expected return of individual asset with in the portfolio
- Risk measurement is commonly measured by standard deviation or variance of return with high value represent high risk

c)

Expected Portfolio return		**Weighting**	**Expected Return**	**Weighting Expected Return**
Investment in (A)	4,000,000	0.4	11%	4.4%
Investment in (B)	6,000,000	0.6	25%	15.0%
Total Investment	10,000,000	1		19%

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

ii)

ii) portfolio risk	
Standard deviation A (SD A)	15
Standard deviation B (SD B)	20
Weight A	0.4
Weight B	0.6
Correlation coefficient	0.3

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

Portfolio Risk=$\sqrt{(0.4^2 * 0.15^2) + (0.6^2 * 0.2^2) + 2 * 0.4 * 0.6 * 0.15 * 0.2 * 0.3}$

Portfolio Risk= 15%

End of marking guide and model answer