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CERTIFIED PUBLIC ACCOUNTANT
ADVANCED LEVEL 2 EXAMINATIONS
A2.1: STRATEGIC CORPORATE FINANCE
DATE: WEDNEDAY 26, AUGUST 2026

INSTRUCTIONS:

1. Time Allowed: **3 hours 45 minutes** (15 minutes reading and 3 hours 30 minutes writing).
2. This examination has **Two** sections: **A & B.**
3. Section **A** has **One Compulsory Question** while Section **B** has **Three Optional questions** to choose any **Two.**
4. In summary attempt **three questions.**
5. Marks allocated to each question are shown at the end of the question.
6. The question paper should not be taken out of the examination room.

SECTION A

QUESTION ONE

IKIREZI CONNECT Ltd is a Rwandan company that provides internet connectivity services including broadband, fibre-optic, and enterprise data services across Kigali and selected secondary cities. Founded in 2018, the company has grown rapidly and currently serves over 85,000 residential and corporate clients.

IKIREZI CONNECT Ltd is jointly owned by three Rwandan entrepreneurs, East Africa Venture Partners (EAVP), and Savana Tech Holdings, a Mauritian holding company that acquired a 35% equity stake in the company in 2022. IKIREZI CONNECT Ltd is now seeking to acquire a 90% stake in NZIZA TECH DEVELOPERS Plc for being listed on Rwanda stock Exchange through reverse takeover (backdoor listing). Management expects the acquisition to be financed using IKIREZI CONNECT's existing capital structure, and accordingly the capital structure of IKIREZI CONNECT Ltd will be used as the basis for valuation.

The company is not listed on the Rwanda Stock Exchange (RSE).

Capital Structure of IKIREZI CONNECT Ltd

IKIREZI CONNECT Ltd is finance through the following sources of finance:

Description	Note	Book Value (FRW)
Ordinary share capital	1	See Note
8% Redeemable Loan Notes (face value FRW 1,000 per note)	2	500,000,000
Bank term loan	3	320,000,000
Government grant-RURA National Broadband Infrastructure Programme	4	1,200,000,000

Notes:

Note 1: Equity (Market Value): IKIREZI CONNECT Ltd has passed through three distinct rounds of external financing. In 2017 - 2018, the three Rwandan founders contributed FRW 150,000,000 of personal capital to develop the initial prototype of its network management platform and to conduct market feasibility studies. The company commenced commercial operations in 2019.

In 2021, East Africa Venture Partners (EAVP), a specialist African technology fund, invested FRW 600,000,000 in exchange for a 25% equity stake. This investment supported the company's expansion beyond Kigali into secondary cities such as Musanze, Rubavu and Huye.

In 2022, Savana Tech Holdings, a Mauritian holding company, acquired a 35% equity stake for FRW 2,800,000,000. This transaction is the most recent arm's-length transaction and represents the best available evidence of the current market value of IKIREZI CONNECT's equity. The company has an established revenue base, proven technology, positive EBITDA and a clear path to profitability, although it has not yet undertaken an initial public offering.

Note 2: Redeemable Loan Notes: The redeemable loan notes have a face value of FRW 1,000 per note and will be redeemed at par in 5 years. The current market price is FRW 960 per note.

Note 3: Bank Term Loan: IKIREZI CONNECT Ltd has secured a bank term loan at a fixed interest rate of 11% per annum. The loan is currently held at book value, which approximates its fair value.

Note 4: Government Grant: The FRW 1,200,000,000 grant was awarded by the Rwanda Utilities Regulatory Authority (RURA) under the National Broadband Infrastructure Programme to part-fund the rollout of fibre-optic cabling in rural districts. The grant was formally recognised in the company's financial statements in the year of receipt as deferred income and is being released to profit or loss on a straight-line basis over the 10-year useful life of the related assets. The grant is not repayable provided IKIREZI CONNECT Ltd meets its rural connectivity milestones. No further conditions are outstanding. The assets funded by the grant do not qualify for tax depreciation allowances.

NZIZA TECH DEVELOPERS(NTD) Plc

NTD Plc is a software and IT solutions company listed on the Rwanda Stock Exchange. The company designs and deploys custom enterprise resource planning (ERP) systems, cybersecurity platforms, and mobile application solutions for both the public and private sectors in Rwanda and East Africa. NZIZA TECH DEVELOPER's client base includes several government ministries, commercial banks, and regional NGOs.

The company currently has 240,000,000 ordinary shares in issue, currently trading at FRW 38 per share. The most recent annual dividend was FRW 2.10 per share and dividends are expected to grow at 5% per annum in line with projected profit growth.

NZIZA TECH DEVELOPERS has recently experienced margin pressure due to increased competition from South African and Kenyan IT firms entering the Rwandan market. The company's board has indicated openness to a strategic acquisition offer from IKIREZI CONNECT Ltd that operate in the same industry with NZIZA TECH DEVELOPPERS, given the complementary synergies and long-term market positioning that combination would offer.

Financial Information NZIZA TECH DEVELOPERS Plc (Year 1 Base Data)

Description	FRW '000
Revenue	8,450,000
Operating profit (EBIT) after all operating costs but before interest and tax	1,267,500
Depreciation and amortization (included in operating costs above)	312,000
Capital expenditure (maintenance)	180,000
Increase in net working capital	95,000

The above financial data relate to NZIZA TECH DEVELOPERS Plc for the most recent completed financial year (Year 1 base):

Additional information for Years 2 - 4 was provided as follow:

1. Revenue growth rate (Years 2 - 4) is 5% per annum
2. EBIT margin will continue to be constant as at Year 1 ratio
3. Depreciation & amortization is FRW 312,000 per annum

4. Capital expenditure growth rate is 10% per annum (reflecting investment to sustain growth)
5. Change in net working capital is FRW 95,000 per annum
6. Corporation tax rate is 30%
7. Free cash flows from year 5 onwards are expected to grow at 4% per annum forever.

Capital Structure of NZIZA TECH DEVELOPERS Plc

Under capital structure of NZIZA TECH DEVELOPERS include loans taken from commercial Bank of Kigali in most recent years.

Description	Note	Book Value (FRW)
8% Redeemable Loan Notes (face value FRW 1,000 per note)	1	320,000,000
Bank term loan	2	500,000,000

Note 1: Face value FRW 1,000 per note; redeemable at par in 5 years; current market price FRW 960 per note.

Note 2: Fixed interest rate 11% per annum held at book value.

From the perspective of IKIREZI CONNECT Ltd's shareholders, the ambition to acquire a 90% stake in NZIZA TECH DEVELOPERS extends beyond a mere valuation exercise; it represents a strategic decision concerning ownership, control, and the long-term stewardship of the company.. Beneath the headline enterprise value lies a layer of obligations that must first be honored before any claim can be made on the business itself. As these are accounted for, what remains begins to reveal the real prize: the portion of NZIZA TECH DEVELOPERS that rightfully belongs to its equity holders, and ultimately, the stake IKIREZI CONNECT Ltd seeks to command.

Required:

As a Strategic Financial Advisor at a consulting firm, you have been engaged by IKIREZI CONNECT Ltd to serve as an independent advisor. Prepare a formal report that addresses the following matters:

a) **i)** Using the information provided, **determine the fair value per share for NZIZA TECH DEVELOPERS Plc using NPV. Show all workings clearly.** (26 Marks)

ii) Determine the total value of a 90% equity stake in NZIZA TECH, compare this figure to NZIZA TECH's current market capitalisation in order to calculate the implied acquisition premium as a percentage, and advise on whether the acquisition appears financially justified from IKIREZI CONNECT's perspective. (6 Marks)

b) **Identify and explain the stage of venture capital financing IKIREZI CONNECT is currently at, justifying with your answer with FOUR valid points referring to the scenario.** (6 Marks)

c) **Discuss THREE other sources of finance (other than venture capital and the government grant) that would be appropriate for IKIREZI CONNECT Ltd to fund the proposed acquisition of 90% of NZIZA TECH DEVELOPERS Plc, having regard to the company's size, ownership structure, and the strategic nature of the transaction, and rank them according with the Pecking Order Theory.** (6 Marks)

In addition to the report requested in requirement above,

d) **Prepare a memo addressed to the Board of Directors of IKIREZI CONNECT Ltd. Recognizing that not all Board members possess a finance background, the memo should provide a clear and concise summary of the financial rationale for the proposed acquisition, drawing on the valuation findings presented in requirement (a). The memorandum should also identify and discuss TWO key non-financial risks that the Board should carefully consider before proceeding with the acquisition of NZIZA TECH DEVELOPERS Plc.** (6 Marks)

(Total: 50 Marks)

SECTION B

QUESTION TWO

In line with the Government of Rwanda's objective of increasing national savings to 30% of GDP by 2035, TUJYENDANE Fund was established as a pension management fund operating as a collective investment scheme. The fund pools contributions from numerous trustees and investors who share similar investment objectives, enabling the collective investment of these resources in a diversified portfolio of assets for the benefit of its members. This approach allows them to access the capital market with guidance from the fund manager with its philosophy of Safety, Liquidity and a good Return, and considering the lower risk.

As an Investment Analyst of TUJYENDANE Fund, you have been asked to evaluate the appropriate mix of Equity Funds and Bond Funds for the pension scheme. The trustees require an assessment to determine the optimal portfolio allocation and the corresponding expected portfolio return. **The pension fund is choosing a mix of two funds with Expected Result:**

	Expected Return	**Std. Deviation (Risk)**	**Correlation (Equity, Bond)**
Equity Fund	14%	20%	
Bond Fund	6%	8%	$\rho = 0.20$

Separately, TUJYENDANE Fund's trustees have asked the Investment Analyst to advise on how the Fund can pursue superior (abnormal) returns on the equity portion of its portfolio. Four strategic options have been proposed by different members of the investment team:

Option	**Strategy Proposed**
1	A firm employs a team of analysts to examine companies' published annual reports, financial ratios, and industry-wide trends in order to identify stocks that are trading below their estimated intrinsic value. The objective is to uncover potentially undervalued investment opportunities for the benefit of investors.
2	Employ a technical analyst to study share price charts and trading volumes using indicators such as moving averages (SMA/EMA), Relative Strength Index (RSI), MACD, Bollinger Bands, Volume-Weighted Average Price (VWAP), stochastic oscillators, and Fibonacci retracement levels to time buy/sell decisions.
3	Accept an offer from a director of a client company to receive advance, undisclosed details about an imminent merger announcement before it is released to shareholders.
4	Adopt a low-cost, fully diversified index-tracking (passive) fund that mirrors the whole market.

TUJYENDANE Fund is considering expanding its operations by establishing a new division that will provide taxi services within Kigali City. The proposed venture will operate under the slogan, "**Move Kigali Smarter, Greener, Together**," with the aim of offering efficient, environmentally sustainable, and customer-focused transportation services.. Company is considering to finance the new project with a capital structure by combining equity and debt where the finance director is reviewing the company's capital structure to identify the optimum capital structure that maximizes firm value.

The project will require the initial investment of FRW 1 billion for acquiring full Electric Vehicle **(EV)**, the project reflect the good profitability with expect constant EBIT of FRW 250,000,000 per year and the corporate tax rate is 30%, The director of finance has obtained the following

estimates of the cost of equity and cost of debt at different levels of gearing where market return is estimated to be 10% and risk-free rate 5%:

Debt / Total Capital	Equity Beta Factor (B)e	Pre-tax Cost of Debt (Kd)	
0%	1.4	-	All-equity
20%	1.6	6.00%	Low leverage
40%	2	7.50%	Moderate leverage
60%	2.8	10.00%	High leverage

Required:

Prepare a report to the Chief Investment Officer (CIO) of TUJYENDANE FUND that:

a) **Determine the expected return and risk of the Equity and Bond portfolio at equity weightings of 0%, 25%, 50%, and 100%, and determine the minimum-variance portfolio. Point your results on a risk-return graph and advise the trustees on the optimal mix for a moderate-risk investor.** (13 Marks)

b) **Critically evaluate Options 1-3 against the relevant forms of the Efficient Market Hypothesis, explaining what each form implies about the likelihood of each strategy delivering sustainable abnormal returns; Advise the trustees, with justification, on which strategic option(s) should be adopted, rejected, or modified.** (6 Marks)

c) **Evaluate and justify the optimal capital structure for TUJYENDANE FUND for financing Eco-project Investment opportunity by maximizing the shareholders wealth and illustrate your results on a graph of WACC against gearing.** (6 Marks)

(Total: 25 Marks)

QUESTION THREE

Rwanda Day is a flagship event organized by the Government of Rwanda to engage with the Rwandan diaspora and friends of Rwanda living abroad while promoting investment, international trade, tourism and national development. In 2024, Rwanda day was held in Washington, D.C, United States, providing an important platform for networking and business partnerships between Rwanda and Internation Companies.

During these event, UBUMANZI GROUP, Rwandan import and export company specializing in exporting different made in Rwanda products, secured a business partnerships with MC COFFE STORE, a company based in the Unites states, to supply premium Rwanda coffee.

The Managing Director of UBUMANZI GROUP, who attended the event, informed the Board of Directors about an agreement entered into with MC COFFEE STORE. Under the agreement, MC COFFEE STORE purchases Rwandan coffee from UBUMANZI GROUP and is granted an average trade credit period of three months.UBUMANZI has also exported 7,000 bags of coffee at USD 120 each. MC COFFE STORE will pay in 3 months. UBUMANZI encourages early payment by offering a 0.1% discount for each full month a customer settles their balance prior to the due date, and 90% of customers exercise this option.

To expand into the South American tea market, UBUMANZI Group has established a subsidiary in Argentina. The parent company in Rwanda imported four AI-automated production machines from LENO Inc. at USD 25,000 each (payable in 3 months) to be installed and operated at the subsidiary in Argentina.

The exchange rates are as follows: 1USD to FRW

	Buy/Ask	Sell/Put
Spot	1,462	1,472
Three months forward	1,572	1,582

Annual money market Interest rates are as follows:

	Borrowing	**Lending**
Rwanda	15% p. a	10% p. a
USA	12% p. a	8% p. a

To diversify Group operations and generate additional short-term returns, Investment Department of UBUMANZI GROUP operates a proprietary trading desk, Trio Coin Capital, which trades Bitcoin (BTC/USDT) using pre-funded accounts on three international exchanges as part of the Group's treasury management activities.

At 10:00:00 AM on the Coordinated Universal Time clock, Trio Coin Capital's desk captured the following BTC/USDT order book snapshot across its three pre-funded exchange accounts:

Cryptocurrency Exchange Platform	**Bid (USDT)**	**Ask (USDT)**	**Trading Fee (per side)**	**Withdrawal Fee (BTC)**
A - Bin	61,480	61,510	0.10%	0.0002
B - Kra	61,620	61,660	0.16%	0.0005
C - CoinCycle	61,550	61,590	0.25%	0.00015

The company's management is concerned about the potential impact of foreign exchange fluctuations between the Rwandan Franc (FRW) and the United States Dollar (USD) during the three-month credit period. Consequently, the Board has instructed management to evaluate the available foreign exchange risk management strategies and present appropriate recommendations at the next Board meeting.

Required:

Prepare a report to the Management of UBUMANZI GROUP addressing the following matters:

a) Using Leading, Forward Market Cover and Money Market Cover, **Evaluate the appropriate foreign exchange hedging strategies available to the company. Based on your analysis, recommend the most suitable hedging.** (12 Marks)

b) **Advise Investment Department of UBUMANZI GROUP on whether the arbitrage trade should be executed, and recommend any risk controls the desk should adopt for future arbitrage opportunities.** (5 Marks)

c) With reference to UBUMANZI GROUP's foreign transactions, **discuss the types of foreign exchange exposure that arise. and justify your classification using specific facts from the scenario.** (6 Marks)

d) **Discuss the key factors that UBUMANZI GROUP should consider before deciding whether to hedge its foreign exchange exposure through the foreign exchange market.** (2 Marks)

(Total: 25 Marks)

QUESTION FOUR

SALAMA MACHINE GROUP ("SMG"), a company incorporated in Rwanda in 2020, is domiciled at Kigali Prime Economic Zone. The company specializes in the manufacturing of construction materials, including roofing tiles, roofing sheets, roofing nails, and other related products. SMG has built a strong reputation in the domestic construction supply market, with its vision anchored on producing durable and comfortable products that exceed customer expectations. The company currently serves major construction contractors across Kigali, Huye, Musanze, and Rubavu, and has recently begun exploring regional export opportunities within the East African Community. SMG's cost of capital is 10%, and the applicable income tax rate is 30%.

The Existing machine

SMG's production is based on a single primary manufacturing line built around one heavy machine. The machine was acquired 5 years ago at an original cost of FRW 80,000,000, with a useful life of 10 years on a straight-line depreciation basis and zero salvage value at the end of its useful life. The machine therefore has a remaining useful life of 5 years and an estimated current market disposal value of FRW 25,000,000. Revenue and variable costs are both directly proportional to machine hours, revenue generated per production hour is FRW 550,000 and contribution margin per production hour is FRW 350,000.

Historically, before the onset of accelerated deterioration approximately eighteen months ago, the machine operated close to its full rated capacity of 2,000 hours per year, generating strong and stable annual revenues.

Table 1: Projected data for the existing machine (Year 0 = Current Position; Years 1-5 = Remaining Useful Life)

Year	0	1	2	3	4	5
Maintenance & repair cost (FRW '000)	-	5,000	6,500	8,200	10,400	13,000
Production downtime (hours/year)	-	180	270	360	450	540
Market (disposal) value (FRW '000)	25,000	20,000	15,000	10,000	5,000	0

Available production hours in any year = 2,000 rated hours less that year's downtime.

The replacement decision

In alignment with global industry manufacturing trends, management is contemplating replacement of the existing machine with a new-generation machine. Management has the option to replace the existing machine immediately, or defer replacement for two years.

The proposed machine incorporates advanced technologies, including automated production systems, AI-assisted quality inspection, energy-efficient motors, predictive maintenance capabilities, and digital production monitoring. Collectively, these features are expected to enhance production efficiency, increase output speed, and reduce material wastage compared with the existing machine. Given the rapid pace of technological change in this area, management considers the technology to have a relatively short economic life and believes that periodic replacement of the machine is more cost-effective than undertaking partial upgrades.

The new machine's useful life is estimated at 5 years.

New Machine - Specification (if acquired immediately)

Item	Value
Cost of new machine	FRW 110,000,000
Depreciation method	Straight-line over 5-year useful life, nil residual value for depreciation purposes
Base annual production capacity	1,920 hours
Projected first-year annual sales (at 1,920-hour capacity)	FRW 1,056,000,000
Annual maintenance & repair cost	Nil (covered under warranty for the full 5-year useful life)
Annual fixed cost savings (relative to the existing machine)	FRW 1,000,000 per annum

Production downtime schedule (new machine, own aging clock, starting from acquisition):

Year of new machine's life	1	2	3	4	5
Production downtime (hours/year)	90	180	270	360	450

Available production hours in any year of the new machine's life = 1,920 base hours less that year's downtime shown above.

Market resale value: the new machine's market resale value is expected to decline on a reducing-balance basis at 40% of the prior year's closing value and when the new machine is acquired, receivables will increase by FRW 35,000,000 and payables will increase by FRW 5,000,000 remains constant for the life of the project.

Deferred replacement option

If SMG decides to postpone the replacement decision for two years rather than replacing the machine immediately, the same machine specification described above will remain available. Its production capacity, expected downtime schedule, fixed cost savings, resale value depreciation pattern, and working capital requirements will be unchanged and will commence from the actual date of acquisition in two years' time. The only difference is purchase cost: due to anticipated import cost inflation, the machine's purchase price will be 20% higher if acquired in 2 years' time.

Required:

As asset manager of SALAMA MACHINE GROUP:

a) Using the Equivalent Annual Cost (EAC) method and the data in Table 1 only, **determine the year within the existing machine's remaining 5-year life at which the equivalent annual cost of continuing to operate it is minimized, and hence recommend the optimal year to replace it.** *Evaluate only first three years* (6 Marks)

b) Using the financial information provided, **evaluate whether the existing machine should be replaced with the new machine, considering both the "replace immediately" and "defer 2 years" scenarios.** (19 Marks)

(Total: 25 Marks)

End of Question Paper

Present Value Table

Present value of $1, that is (1 + r)^-n
where r = interest rate; n = number of periods until payment or receipt.

Periods	Interest rates (r)									
(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239

Periods	Interest rates (r)									
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065

Annuity Table

Present value of an annuity of 1, ie [1-(1+r)^-n]/r Where
r = discount rate; n = number of periods.

Periods	Interest rates (r)								
(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606

Periods	Interest rates (r)								
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675