THE INSTITUTE OF CHARTERED ACCOUNTANTS OF NIGERIA

SKILL LEVEL EXAMINATION - PILOT QUESTIONS AND SOLUTIONS

FINANCIAL MANAGEMENT

TIME ALLOWED: 3¼ hours (including 15 minutes reading time)

INSTRUCTION: YOU ARE REQUIRED TO ATTEMPT FIVE OUT OF SEVEN QUESTIONS IN THIS PAPER

SECTION A: **COMPULSORY QUESTIONS**   **(30 MARKS)**

QUESTION 1

Kings Ltd is a listed company that has built up an excellent reputation in Lagos as a manufacturer of smart, space-saving furniture that has proved very popular with young people who often live in small apartments.

As a growth strategy, the Board of Directors has decided to expand the company's operations by establishing a factory in Abuja. Their intention is to invest in a small, temporary factory that will have a useful life of four years. The performance after 4 years would then aid the Board to decide on whether to invest in a permanent factory or discontinue with the Abuja expansion strategy.

A feasibility study carried out by the finance director's office has produced the following information;

i   The initial investment in the small, temporary factory will be N12m and the residual value after four years will be N4.5m.

ii   Tax allowable depreciation will be claimed at an annual rate of 25% reducing balance in years 1 to 3. At the end of year 4, any remaining written down value will be claimed as a balancing adjustment.

iii   Sales revenue in year 1 is expected to be N7.9m, and this is expected to increase at 5% per year in each of years 2 to 4.

iv   Operating costs are expected to be 5.2m in year 1. The pre-inflation amounts for year 2 to 4 are given below, as are the annual inflation rates for operating costs in each year 2 to 4:

Year	2	3	4
Pre-inflation amount	(N)5.35m	5.66m	6.03m
Annual Inflation rate	6%	7%	8%

v   It is anticipated that the working capital of 20% of sales revenue will be needed at the start of each year. At the end of the project, it is expected that all the accumulated working capital will be released.

vi	Kings Ltd pays tax at a rate of 20% on profit in the year in which the tax liability occurs. Any tax losses on the investment can be carried forward and written off against future profits from the investment.
vii	The cost of capital for Kings Ltd has been estimated at 12%.

Required

a. Calculate the net present value of the Abuja expansion project and advise the company on the viability of the proposed expansion   (24 Marks

b. Are their assumptions that weaken the reliability of the appraisal method adopted in (a)? Discuss three of such, if any   (6 marks)

Total 30 Marks)

SECTION B: YOU ARE REQUIRED TO ATTEMPT TWO OUT OF THREE QUESTIONS IN THIS SECTION   (40 MARKS)

QUESTION 2

Hilldex Ltd is looking to spend N15m to expand its existing business. This expansion is expected to increase profit before interest and tax by 20%. Recent financial information relating to Hilldex Ltd can be summarised as follows:

	(₦000')
Profit before interest and taxation	13,040
Finance charges (interest)	240
Profit before taxation	12,800
Taxation	3,840
Profit for the year (earnings)	8,960

Hilldex is not sure whether to finance the expansion with debt or equity. If debt is chosen, the company will issue N15m of 6% loan notes at their nominal value of N100 per loan note. If equity is chosen, the company will have a 1 for 4 rights issue at a 20% discount to the current market price of N6.25 per share. Hilldex has 12 million shares in issue. The company pays tax at 30%.

The shareholders of Hilldex Ltd are apprehensive over the likely impact of the expansion on their earnings.

Required:

a. Determine the EPS if debt is used to finance the expansion   (8 marks)

b. Determine the EPS if equity is used to finance the expansion.   (8marks)

c. Based on the financial position of the shareholders, evaluate and advise

whether Hilldex Ltd should finance the expansion with debt or equity?   (4 marks)
(**Total 20 Marks**)

QUESTION 3

The Board of Drew Plc. (DP) is planning to further diversify its company's portfolio into the telecommunication market. The Board is presently seeking to know whether the securities of 3 prospective companies, Aqua Plc., Bright Plc. and Connect Plc. all in the telecommunication industry are correctly priced or not. Currently, the rate of return on the Federal Government Bond redeemable at par in the year 2025 is 6%. The average expected return on market portfolio is 11% subject to a 4% risk (standard deviation).

Other relevant information relating to the three securities of the companies is as stated below:

	Standard Deviation	Correlation Coefficient	Expected Returns
Aqua Plc (A)	0.075	0.640	13%
Bright Plc (B)	0.086	0.680	15%
Connect Plc (C)	0.135	0.740	21%

Required:

a.   Calculate the Beta and the required return of the securities A, B and C   (10 marks)
b.   Compute the Alpha of each security and advice the Board on the securities to
        be bought and why.   (6 marks)
c.   Outline any **FOUR** assumptions of Capital Asset Pricing Model (CAPM)   (4 marks)
(**Total 20 marks**)

QUESTION 4

Light Speed Company (LSC), a tech firm that saw rapid growth financed by retained earnings, is now experiencing a slowdown, with its EPS sharply declining from N10.9 in 2020 to N2.9 in 2024. The CEO believes initiating cash dividends will attract investors and boost share prices, arguing that many value regular payouts. The CEO also realized that if the board approved his recommendation, it would have to (1) establish a dividend payout policy and (2) set the amount of the initial annual dividend. However, the CFO is concerned that a dividend payout could negatively impact future financing and the firm's share price, especially given the uncertain earnings.

LSC's management is currently evaluating three potential dividend policies:

Constant-payout-ratio dividend policy

Regular dividend policy

Low-regular-and-extra dividend policy

Required:

a. Analyze each of the three dividend policies in light of LSC's declining earnings. (6 marks)
b. Recommend and justify the best dividend policy for the company (4 marks)
c. Discuss the key factors to consider when setting the amount of a firm's initial (4 marks)
    annual dividend.
d. Based on your dividend policy recommendation in part (b), how large an initial
    dividend would you recommend? Justify your recommendation. (6 marks)
    (Total 20 marks)

SECTION C: YOU ARE REQUIRED TO ATTEMPT TWO OUT OF THREE QUESTIONS IN THIS SECTION. (30 MARKS)

QUESTION 5

Bode Ltd. is a medium-sized manufacturing company that produces a wide range of cosmetic products. Bode Ltd relies heavily on cocoa beans as a critical component used in its production process. The company follows a continuous review inventory system and has established specific policies for ordering and stocking cocoa beans.

The company consumes 18,000,000 tons of the cocoa beans annually and has determined that inventory should be replenished whenever the level falls to 800,000 tons. Each order placed is for 400,000 tons.

The holding cost of the item is N1, 000 per unit per year, and the cost to place an order is N4, 125,000. Suppliers deliver the order within a 2-weeks lead time, and the company operates on a 50-weeks year. Weekly demand is assumed to be constant throughout the year. The company policy is to maintain a buffer stock of 80,000 tons which is inclusive in the reorder level of 800.000 tons.

Required:

a. Calculate the Economic Order Quantity (EOQ) for Bode Ltd (5 marks)
b. Evaluate whether the company's current order quantity of 400,000 tons aligns with
    the EOQ model. Should the company adjust its order size? (3 marks)
c. Determine the weekly demand for the item. (1 mark)
d. Calculate how much annual savings could be obtained using the EOQ model. (6 marks)

QUESTION 6

Duro Energy PLC, a publicly listed company based in Nigeria, specializes in energy infrastructure and power generation. The company's board of directors has approved a major expansion project to build a

new gas-fired power plant. To finance this project, the Chief Financial Officer (CFO), Funke Adebayo, is considering raising N5 billion through the issuance of corporate bonds.

After consulting with investment bankers, two potential bond structures have been identified:

Option A: Irredeemable Bond (Perpetual Bond)

Face Value: N1, 000
Annual Coupon Rate: 12%

Option B: Redeemable Bond

Face Value: N1, 000
Annual Coupon Rate: 14%
Maturity Period: 5 years
Redemption: At par (N1, 000)

Due to current market conditions and Duro Energy's financial health, the company has determined that the appropriate required rate of return (or yield to maturity) for its bonds is 10%.
CFO Adebayo needs to determine the fair market value of each bond to assess which option would be more attractive to investors, thereby allowing the company to raise the required capital more efficiently.

Required:

a**.** Calculate the current market value of the **irredeemable bond (Option A)**.   (3 marks)
b. Calculate the current market value of the **redeemable bond (Option B)**.   (7 marks)
c. Based on your calculations, compare the two bond values and advise CFO Adebayo on which option she should recommend to the board. Justify your recommendation with a clear explanation of why that bond would be more favorable for the company.   (5 marks)
                                                                                        (Total 15 marks)

Question 7

Explain and illustrate what is meant by disintermediation and securitisation. How can disintermediation and securitisation help the financial manager?   (15 marks)

Formulae

Modigliani and Miller Proposition 2 (with tax)

$$K_{EG} = K_{EU} + (K_{EU} - K_D) \frac{V_D}{V_{EG}} (1 - t)$$

Asset Beta

$$\beta_A = \left[\frac{V_E}{(V_E + V_D(1 - T))} \beta_E \right] + \left[\frac{V_D(1 - T)}{(V_E + V_D(1 - T))} \beta_D \right]$$

Equity Beta

$$\beta_E = \beta_A + (\beta_A - \beta_D) \left(\frac{V_D}{V_E} \right) (1 - t)$$

Growing Annuity

$$PV = \frac{A_1}{r - g} \left(1 - \left(\frac{1 + g}{1 + r} \right)^n \right)$$

Cash Management

i)   Optimal sale of securities, Baumol model:

$$\text{Optimal sale} = \sqrt{\frac{2 \times \text{Annual cash disbursements} \times \text{Cost per sale of securities}}{\text{interest rate}}}$$

ii)   Spread between upper and lower cash balance limits, Miller-Orr model:

$$\text{Spread} = 3 \left[\frac{\frac{3}{4} \times \text{transaction cost} \times \text{variance of cash flows}}{\text{interest rate}} \right]^{\frac{1}{3}}$$

Annuity Table

Present value of an annuity of 1 i.e. $\dfrac{1 - (1+r)^{-n}}{r}$

Where   r = discount rate

        n = number of periods

Discount rate (r)

Periods

(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	1
2	1·970	1·942	1·913	1·886	1·859	1·833	1·808	1·783	1·759	1·736	2
3	2·941	2·884	2·829	2·775	2·723	2·673	2·624	2·577	2·531	2.487	3
4	3·902	3·808	3.717	3·630	3.546	3.465	3·387	3·312	3·240	3·170	4
5	4·853	4·713	4·580	4·452	4·329	4·212	4·100	3·993	3.890	3·791	5
6	5·795	5·601	5·417	5·242	5·076	4·917	4·767	4·623	4.486	4·355	6
7	6·728	6.472	6·230	6·002	5·786	5·582	5·389	5·206	5·033	4·868	7
8	7·652	7·325	7·020	6·733	6·463	6·210	5·971	5·747	5·535	5·335	8
9	8·566	8·162	7·786	7.435	7·108	6·802	6·515	6·247	5·995	5·759	9
10	9·471	8·983	8·530	8·111	7·722	7·360	7·024	6·710	6.418	6·145	10
11	10·368	9·787	9·253	8·760	8·306	7·887	7.499	7·139	6·805	6.495	11
12	11·255	10·575	9·954	9·385	8·863	8·384	7·943	7·536	7'161	6·814	12
13	12·134	11·348	10·635	9·986	9·394	8·853	8·358	7·904	7·487	7·103	13
14	13·004	12·106	11·296	10·563	9·899	9·295	8·745	8·244	7·786	7·367	14
15	13·865	12·849	11·938	11·118	10·380	9·712	9·108	8·559	8·061	7·606	15

(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	1
2	1·713	1·690	1·668	1·647	1·626	1·605	1·585	1·566	1·547	1·528	2
3	2.444	2.402	2·361	2·322	2·283	2·246	2·210	2·174	2·140	2·106	3
4	3·102	3·037	2·974	2·914	2·855	2·798	2·743	2.690	2·639	2.589	4
5	3·696	3·605	3·517	3·433	3·352	3·274	3·199	3·127	3·058	2·991	5
6	4·231	4·111	3·998	3·889	3·784	3·685	3·589	3.498	3.410	3·326	6
7	4·712	4·564	4.423	4·288	4·160	4·039	3·922	3·812	3·706	3·605	7
8	5·146	4·968	4.799	4·639	4.487	4·344	4·207	4·078	3·954	3·837	8
9	5·537	5·328	5·132	4·946	4·772	4·607	4.451	4·303	4·163	4·031	9
10	5·889	5·650	5.426	5·216	5·019	4·833	4·659	4.494	4·339	4·192	10
11	6·207	5·938	5·687	5.453	5·234	5·029	4·836	4·656	4.486	4·327	11
12	6·492	6·194	5·918	5·660	5·421	5·197	4·988	4·793	4·611	4.439	12
13	6·750	6.424	6·122	5·842	5·583	5·342	5·118	4·910	4·715	4·533	13
14	6·982	6·628	6·302	6·002	5·724	5.468	5·229	5·008	4·802	4·611	14
	7·191	6·811	6.462	6·142	5·847	5·575	5·324	5·092	4·876	4·675	15

SOLUTION 1

a.   Net Present Value (NPV) Calculation

To calculate the NPV of the Abuja expansion project, we will consider all relevant cash flows over the four years, including sales revenue, operating costs, tax impacts, depreciation, and the eventual recovery of working capital.

NPV(₦)

Year	0	1	2	3	4
Sales revenue (w1)		7,900,000	8,295,000	8,709,750	9,145,238
Operating cost (w2)		(5,200,000)	(5,661,000)	(6,057,270)	(6,512,400)
Cash operating profit		2,700,000	2,634,000	2,652,480	2,632,838
Tax at 20%		(540,000)	(526,800)	(530,496)	(526,568)
Tax savings on depr.(w3)		600,000	450,000	337,500	112,500
Working capital (w4)	(1,580,000)	(79,000)	(82,950)	(87,098)	1,829,048
Investment	(12,000,000)				4,500,000
NCF	(13,580,000)	2,681,000	2,474,250	2,372,386	8,547,818
PVF at 12%	1.000	0.893	0.797	0.712	0.636
Present value	(13,580,000)	2,394,133	1,971,977	1,689,139	5,436,413

NPV= (₦ 2,088,388)

The negative NPV indicates that the project would result in a loss. The Abuja project as proposed should be rejected.

Working notes:

1. **Sales Revenue:**

    - Year 1: 7,900,000
    - Year 2: 7,900,000 × 1.05 = 8,295,000
    - Year 3: 8,295,000 × 1.05 = 8,709,750
    - Year 4: 8,709,750 × 1.05 = 9,145,238

2. **Operating Costs:**

    The pre-inflation operating costs for years 2-4 are given as:

    - Year 2: 5.35 million
    - Year 3: 5.66 million
    - Year 4: 6.03 million

    Now, we will apply the inflation rates to these figures:

    - Year 2: 5.35 million × (1 + 6%) = 5,661,000
    - Year 3: 5.66 million × (1 + 7%) = 6,057,270
    - Year 4: 6.03 million × (1 + 8%) = 6,512,400

3. **Tax savings on tax allowable depreciation:**

	Depreciation	WDV	Tax savings @20%
Year 1: 25% of 12,000,000	3,000,000	9,000,000	600,000
Year 2: 25% of 9,000,000	2,250,000	6,750,000	450,000
Year 3: 25% of 6,750,000	1,687,500	5,062,500	337,500
Balance	5,062,500		
Year 4: Residual value	(4,500,000)		
Balancing allowance	562,500		112,500

4. Incremental Working capital

Year	0	1	2	3	4
Cumulative(20% of sales)		1,580,000	1,659,000	1,741,950	1,829,048
Incremental cash flows	(1,580,000)	(79,000)	(82,950)	(87,098)	(1,829,048)

b. Net present value (NPV) is a calculation that discounts a future stream of cash flows back into the present day. NPV seeks to determine the present value of future cash flows of an investment above its initial cost.

The NPV as an investment appraisal is built on the assumptions that suitable; discount rate, cost of capital and cash flows can be accurately determined. These assumptions in practice may not be tenable.

i   **Selecting an accurate discount rate**: In real terms, it can be challenging to accurately arrive at a discount rate that represents the investment's true risk premium.More so, the investment won't have the same level of risk throughout its entire time horizon, either, and this makes matters even more complex.

ii **Selecting an appropriate cost of capital**: Another problem is that a company may select a cost of capital that's either too high or too low leading it to miss a profitable opportunity. It's estimation without certainty. For instance, the Abuja expansion project may have been accepted if a different cost of capital is used.

iii **Cash flow projections**: Again, the cash flows as projected in the appraisal might be too high as most financial managers are too optimistic about the success of the project. Hence, there can be a problem of being upwardly biased with respect to this method.

iv **NPV typically focuses on short-term projects:** Net Present Value produces an investment ratio that typically focuses on short-term projects instead of looking for long-term results because of future uncertainties. If a company were to evaluate a project looking at the near-term profit potential it creates, then the decision-makers may undervalue what the long-term profitability of a project could be.This disadvantage means that some companies may select the incorrect project to pursue when comparing their options.

SOLUTION 2

Given:

Profit before Interest & Tax (PBIT)	13,040
Finance Charges (Interest)	240
Profit before Tax (PBT)	12,800
Taxation (30%)	3,840
Profit for the Year (Earnings)	8,960
No. of shares	12,000,000
Market price per share	6.25
Expansion cost	15,000,000
Increase in PBIT (20% of 13,040)	**2,608**
New PBIT after expansion	**15,648**

a.   Scenario 1: Financing with debt

New financials:

	(₦000')	(₦000')	(₦000')
New PBIT			15,648
Interest expense:			
Old interest=	240		
New interest (6% of 15m)	900	(1,140)	
PBT		14,508	
Tax at 30%		(4,352.4)	
Profit after tax		10,155.6	
EPS: Shares remain: 12m EPS=10,155.6/12,000 = ₦ 0.8463			

b.   Scenario 2: Financing with Equity (right issue)

Market price per share ₦ 6.25
Discount =20%
Issue price= N5.00
Rights ration=1 for 4
New shares issued = 12m/4= 3m shares
Total raised= 3m x N5.00= N15m

New financials:

	(₦000')
New PBIT	15,648
Interest expense	(240)
PBT	15,408
Tax	(4,622.4)
Profit after tax	10,785.6
EPS: New shares= 12m + 3m = 15m EPS= 10,785.6/15,000 = ₦ 0.719	
Comparison: Old EPS (8,960/12,000): ₦ 0.747 EPS after Debt financing: ₦ 0.846 EPS after Equity financing:₦ 0.719	

c.   Recommendation

From the perspective of EPS and shareholders wealth, debt financing is more favorable and should be adopted, as EPS is increased by 13% compared to equity financing that led to a decline in share earnings by 4%.

Though, the financing through debt does increase the financial risk of higher interest burden especially in cases of declining profit levels. Thus, the directors need to be aware of this risk so as not to lose sight of the critical importance of balancing risks and returns.

SOLUTION 3

i   Step 1: is to determine the beta(β) of each securities:

$$\beta = \frac{(Covariance\ with\ market)(Standard\ deviation\ of\ project)}{Standard\ deviation\ of\ the\ market}$$

Aqua Plc. (A) β= $\frac{(0.640)(7.5)}{4}$ = 1.20

Bright Plc. (B) β= $\frac{(0.680)(8.6)}{4}$ = 1.46

Connect Plc. (C) β= $\frac{(0.740)(13.5)}{4}$ = 2.50

Step 2: Computation of the required returns using CAPM

$R_i = R_f + Bi (R_m - R_f)$

A: R_A = 4 + 1.20(11-4) = 12.4%

B: R_B = 4 + 1.46(11-4) = 14.2%

C: R_C = 4 + 2.50(11-4) = 21.5%

ii   Calculation of the alpha of each security and make conclusion

C1	C2	C3	C4	C5
Security	**Expected return**	**Required return**	**Alpha (C2 – C3)**	**Remarks**
A	13%	12.4%	0.6%	undervalued
B	15%	14.2%	0.8%	undervalued
C	21%	21.5%	-0.5%	overvalued

Advice:

Securities with **positive** alpha(A and B) are undervalued and should be bought as they allow the company to buy the securities at a price lower than the intrinsic value, creating potential for significant gains when the market recognizes the stock's true worth.
While the security C with **negative** alpha is overvalued and should not be bought so as to minimize the risk of loss.

iii.   Assumptions of Capital Asset Pricing Model (CAPM) include the following:

- Investors only need to know the expected returns, the variances, and the covariance of returns to determine which portfolios are optimal for them.
- Investors have identical views about risky assets' mean returns, variances of returns, and correlations.
- Investors can buy and sell assets in any quantity without affecting price; all assets are marketable (can be traded).
- Investors can borrow and lend at the risk-free rate without limit, and they can sell short any asset in any quantity.
- Investors pay no taxes on return.
- Investors pay no transaction costs on trades.
- All investors' decisions are based on a single time period.

SOLUTION 4

a.   **Analysis of Dividend Policies**
Based on LSC's declining and volatile earnings per share (EPS), each dividend policy presents a unique risk-reward profile.

Constant-payout-ratio: This policy would pay a fixed percentage of LSC's earnings as dividends. Given the sharp decline in EPS from N10.9 in 2020 to N2.9 in 2024, the dividend would also fall dramatically. This would highlight the company's financial instability to investors and likely cause more concern rather than attract new shareholders, failing to meet the CEO's objective.

Regular dividend: This policy would pay a fixed dividend amount each period. This offers the stability and predictability that the CEO seeks. However, with LSC's declining earnings trend, setting a regular dividend carries the significant risk that future earnings may not be sufficient to cover the payment. A dividend cut is a highly negative signal to the market and could accelerate the decline in the firm's share price, validating the CFO's concerns.

Low-regular-and-extra: This policy involves a small, consistent dividend that is easily sustainable, even with declining earnings. It is supplemented by an "extra" dividend when the company's performance is strong. This approach offers the best of both worlds: it provides the stability investors desire while retaining the flexibility to manage cash flow and avoid a potentially disastrous dividend cut.

b.   **Recommended Dividend Policy**

I recommend that LSC adopt the low-regular-and-extra dividend policy.

This policy is the most suitable for LSC's current situation because it balances the conflicting goals of the CEO and CFO. It provides a stable, regular income stream that can attract investors (meeting the CEO's goal) while being conservative and flexible enough to manage the risk of declining earnings (addressing the CFO's concerns). The low regular dividend signals confidence without over committing, and the "extra" dividend allows the company to share profits during good years without creating an unsustainable precedent.

c.   **Key Factors for Setting an Initial Dividend**

When setting an initial dividend, LSC must consider several key factors:

- **Sustainability of Earnings:** The dividend amount should be low enough to be paid consistently, even if EPS continues to decline in the short term.
- **Cash Flow:** The Company must have adequate cash flow to cover the dividend payments without hindering its operational needs or investment in future growth.
- **Investment Opportunities:** LSC must assess its future growth prospects. Since its rapid growth is slowing, paying a dividend may be a better use of cash than reinvesting it in less-profitable projects.

- **Shareholder Expectations:** The dividend must be meaningful enough to attract new investors but not so high that it creates an unsustainable expectation for the future.

d.   **Recommended Initial Dividend Amount**

Based on the low-regular-and-extra policy recommendation, I would propose an initial regular dividend of between N0.80 – N1.20 per share.

This amount is justified for the following reasons:

- **Sustainability:** A dividend of N0.80 - N1.20 is well below the company's most recent EPS of N2.90. This makes it highly likely that the company can sustain the dividend for the foreseeable future, even if earnings continue to fluctuate around the N2.90 mark
- **Conservative Payout:** This dividend represents a modest payout ratio of approximately 27.6% - 41.4% - (N0.80 / N2.90) - (N1.20 / N2.90). This allows the company to retain a significant portion of its earnings for reinvestment or to build a cash reserve, mitigating the risks highlighted by the CFO.
- **Positive Signal:** By setting a conservative but reliable dividend, LSC signals its commitment to shareholders while prudently managing its financial resources.

SOLUTION 5

a.   Calculate Economic Order Quantity (EOQ)

The EOQ is calculated using the formula:

$$EOQ = \sqrt{\frac{2DS}{H}}$$

Where:

- **D** (Annual Demand) = 18,000,000 tons
- **S** (Ordering Cost) = N4,125,000
- **H** (Holding Cost) = N1,000 per unit per year

By substituting these values, the calculation is:

$$EOQ = \sqrt{\frac{2 \times 18,000,000 \times 4,125,000}{1,000}}$$

$$= \sqrt{\frac{148,500,000,000,000}{1,000}}$$

$$=\sqrt{148,500,000,000}$$

$= \approx 385,357$ tons

b. Evaluate current order quantity (400,000) vs EOQ (385,357):

Current order quantity = 400,000 tons
EOQ = 385,357 tons

Conclusion:

- Current order size is slightly larger than the EOQ, which means higher holding costs.
- For optimal cost savings, the company should slightly adjust its order size to the EOQ of 385,357 tons to minimize its combined annual ordering and holding costs.

c. **Determine the weekly demand**:

Weekly demand $=\dfrac{18,000,000}{50}$

= 360,000 tons / week

d. **Determine annual savings from using EOQ**

Current policy:
Weekly demand = 360,000 tons
The company maintains a buffer stock of 80,000 tons
Average inventory = 400,000 tons/2 + Buffer stock = 200,000 +80,000 = 280,000 tons.

Annual cost of current policy	₦
Order costs: N4,125,000 × (18,000,000/400,000)	185,625,000
Holding costs: 280,000 × N1,000	280,000,000
	465,625,000

Annual cost of EOQ policy	
Order costs: N4,125,000 × (18,000,000/385,357)	192,678,477
Holding costs of EOQ: (385,357/2) × N1,000	192,678,500
Holding cost of buffer stock: 80,000 × N1,000	80,000,000
	465,356,977

Cost of current policy	465,625,000
Annual saving by ordering EOQ	268,023

SOLUTION 6

a.   **Market Value of Irredeemable Bond (Option A)**

The market value of an irredeemable bond is calculated by dividing the annual coupon payment by the required rate of return. This is also known as a perpetual bond since it pays coupons indefinitely.

Annual Coupon Payment (C): N1,000 × 12% = N120
Required Rate of Return (k): 10% or 0.10
Using the formula $P0 = \frac{C}{k}$

$P0 = \frac{N120}{0.10}$ = N1,200

The current market value of the irredeemable bond is N1,200.

b.   **Market Value of Redeemable Bond (Option B)**

The market value of a redeemable bond is the sum of the present value of all future coupon payments (an annuity) and the present value of the final redemption value (a lump sum).

Annual Coupon Payment (C): N1,000 × 14% = N140
Maturity Period (n): 5 years
Redemption Value (RV): N1,000
Required Rate of Return (k): 10% or 0.10

Using the formula $P0 = C \times [\frac{1-(1+k)^{-n}}{k}] + RV \times (1+k)^{-n}$

$P0 = 140 \times [\frac{1-(1+0.10)^{-5}}{0.10}] + 1{,}000 \times (1+0.10)^{-5}$

Present Value of Annuity (Coupons):

$= 140 \times [\frac{1-(1+0.10)^{-5}}{0.10}]$

$= 140 \times [\frac{(1-0.62092)}{0.10}]$

$= 140 \times 3.7908$

$= N530.71$

Present Value of Lump Sum (Redemption):

$= 1{,}000 \times (1 + 0.10)^{-5}$

$= 1{,}000 \times 0.62092$

$= N620.92$

$P0 = N530.71 + N620.92 = N1{,}151.63$

The current market value of the redeemable bond is N1,151.63.

c.   Recommendation

Based on the calculations, CFO Adebayo should recommend issuing the irredeemable bond (Option A).

Market Value Comparison:

Irredeemable Bond (Option A): N1,200
Redeemable Bond (Option B): N1,151.63
Justification**:** The irredeemable bond has a higher market value per unit. This means that for every N1,000 of face value issued, Duro Energy PLC can raise N1,200 from the market. In contrast, the redeemable bond would only raise N1,151.63 per unit. By issuing the irredeemable bonds, the company will have to issue fewer bonds to raise the N5 billion, and it will benefit from the higher premium received at the point of issuance.

SOLUTION 7

Disintermediation and securitisation are two important concepts in modern finance that have significantly reshaped how companies and investors interact in the financial markets. Here's a full explanation and illustration of both, followed by how they can help a financial manager:

a.   **Disintermediation**

Definition

Disintermediation refers to the process of removing financial intermediaries—such as banks or brokers—from transactions between savers and borrowers or investors and issuers. Instead of going through a traditional intermediary, entities deal directly in financial markets.

Illustration

Imagine a company, Alpha Ltd, wants to raise ₦5 billion for expansion:

- With intermediation: Alpha Ltd borrows from a bank at an interest rate of 18% p.a. The bank sources the money from depositors who earn 8% interest. The bank earns the 10% margin for taking the risk and managing the transaction.

- With disintermediation: Alpha Ltd issues corporate bonds directly to institutional investors (like pension funds or insurance companies), offering them 14% p.a. Now, Alpha Ltd saves 4%, and the investors earn more than what the bank would have paid them.

b. **Securitisation**

Definition

Securitisation is the process of pooling illiquid financial assets (like loans, mortgages, or receivables) and converting them into tradable securities that are sold to investors. These securities are backed by the underlying assets and provide returns based on their cash flows.

Illustration

A Nigerian bank, Zebra Bank, has issued thousands of car loans. These loans generate monthly repayments over several years.

- Zebra Bank bundles these loans into a special purpose vehicle (SPV).

- The SPV issues asset-backed securities (ABS) to investors.

- Investors buy the ABS and receive income as car loan borrowers make their payments.

Zebra Bank receives cash upfront and transfers the risk to the investors, freeing up capital to issue more loans.

c. **How Disintermediation and Securitisation Help the Financial Manager**

i. **Benefits of Disintermediation**

Benefit	Explanation
Lower Cost of Capital	By bypassing banks, firms can access cheaper finance through direct borrowing (e.g., bond issues).
Greater Funding Options	Access to diverse investor bases such as pension funds, insurance firms, and high-net-worth individuals.
Increased Transparency and	Firms can structure terms more flexibly when dealing directly with capital

Benefit	Explanation
Control	markets.
Improved Financial Strategy	Easier alignment of debt maturity, cost, and investor expectations.

ii.   Benefits of Securitisation

Benefit	Explanation
Improved Liquidity	Converts illiquid assets (e.g., receivables) into cash without waiting for customer payments.
Risk Transfer	Transfers credit risk of underlying assets to investors, improving risk management.
Capital Efficiency	Frees up regulatory capital and balance sheet capacity, allowing more lending or investment.
Diversification of Funding Sources	Provides an alternative to loans or equity issuance, reducing reliance on banks or shareholders.

Conclusion

Disintermediation and securitisation are strategic tools that allow financial managers to reduce funding costs, improve liquidity, manage risks, and diversify funding sources. By leveraging these techniques, especially in well-developed financial markets, financial managers can align their firm's financing more effectively with its operational and strategic goals.