THE INSTITUTE OF CHARTERED ACCOUNTANTS OF NIGERIA

PROFESSIONAL LEVEL EXAMINATION PILOT QUESTION AND ANSWER

STRATEGIC FINANCIAL MANAGEMENT

Time Allowed 3¼ hours (including 15 minutes reading time)

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

SECTION A: COMPULSORY QUESTION (30 MARKS)

Question 1

Frank's is a listed company in the food retail sector and has large stores in all the major cities in the country. Frank's board is considering diversifying by opening holiday travel shops in all its stores.

At a recent board meeting, the directors were discussing how the holiday travel shops project('the project') should be appraised. The sales director insisted that Frank's current weighted average cost of capital (WACC) should be used to appraise the project as the majority of its operations will still be in food retailing. The finance director disagreed because the existing cost of equity does not take into account the systematic risk of the new project. The finance director also said that the company's overall WACC, which reflects all of the company's activities, would change as a result of the project's acceptance. The board were also concerned about the market's reaction to their diversification plans. A further board meeting was scheduled at which Frank's advisors would be asked to make a presentation on the project.

You work for Frank's advisors and have been asked to prepare information for the presentation. You have established the following:

Frank intends to raise the capital required for the project in such a way as to leave its existing debt: equity ratio (by market values) unchanged following the diversification.

Extracts from Frank's most recent management accounts are shown below:

Statement of financial position at 31 May 2025

	₦m
Ordinary share capital (10 kobo shares)	233
Retained earnings	5,030
	5,263
6% Redeemable bonds at nominal value (redeemable 2029)	1,900
Long term bank loans (interest rate 4%)	635
	7,798

On 31 May 2025 Frank's ordinary shares had a market value of 276 kobo (ex-div) and an equity beta of 0.60. For the year ended 31 May 2025 the dividend yield was 4.2% and the earnings per share were 25kobo. The return on the market is expected to be 8% pa and the risk free rate 2% pa.

Frank's bonds had a market value of ₦108 (ex-interest) per ₦100 nominal value on 31 May 2025 and they are redeemable at par on 31 May 2029.

Companies operating solely in the holiday travel industry have an average equity beta of 1.40 and an average debt: equity ratio (by market values) of 3:5. It has been estimated that if the project goes ahead the overall equity beta of Frank will be made up of 90% food retailing and 10% holiday travel shops. Assume that the tax rate will be 20% pa for the foreseeable future.

Required

a) Ignoring the project, calculate the current WACC of Frank's using:

   i) The CAPM
   ii) The Gordon growth model **(16 marks)**

b) Using the CAPM, calculate the cost of equity that should be included in a WACC suitable for appraising the project and explain your reasoning. **(4 marks)**

c) By calculating an overall equity beta and using the CAPM, estimate the overall WACC of Frank's assuming that the project goes ahead and comment upon the implications of a permanent change in the overall WACC. **(4 marks)**

d) Discuss whether Frank's should diversify its operations and how the stock market might react to the proposed project. **(3 marks)**

e) Identify the appropriate project appraisal methodology that should be used when a project's financing results in a major increase in a company's market gearing ratio and, using the data relating to Frank's, calculate the project discount rate that should be used in these circumstances. **(3 marks)**

(Total: 30 marks)

SECTION B:

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

Question 2

An educational consult company, Educonsult, has raised ₦402,000,000 to establish a unique private university. The establishment of the university depends upon obtaining the necessary approval from the relevant government agency. It is believed that this approval will be given in two years' time.

In the interim, the ₦402,000,000 can be invested in the money market to yield a return of 12% per year. The money market is considered to be an efficient market.

Alternatively, an opportunity exists for the funds to be invested on a temporary basis in Road Flight Ltd (RFL), a luxurious intra city road transport company which wishes to expand its fleet of vehicles. RFL is temporarily short of funds. If the funds are invested with RFL they will produce an annual net cash inflow to Educonsult, but the size of the cashflow is not known with certainty, and cash flow at the end of the second year is dependent upon the cashflow at the end of the first year. Estimates of the net cash inflows to Educonsult are detailed below.

i. **End of year 1**: There are two possible cash flows, ₦160 million with a probability of 60% or ₦200 million with a probability of 40%.
ii. **End of year 2**: If the cash flow in year 1 is ₦160 million, there is a probability of 60% that cash flow in year 2 will be ₦160 million and a 40% probability that it will be ₦180 million. If however, cash flow of ₦200 million occurs in year 1, there is a 60% probability of a cash flow of ₦200 million in year 2 and a 40% probability of receiving ₦220 million in year 2.

In addition, RFL will make a payment to Educonsult at the end of the first year of ₦282 million or at the end of the second year of ₦162 million. Educonsult has to choose at the end of the first year whether to receive payment of ₦282 million then or ₦162 million a year later. If payment of ₦282 million is received by Educonsult at the end of the first year the investment will be terminated and there will be no further cash flows.

A cost of capital of 18% is considered to be appropriate in RFL business.

Required:

a) Prepare calculations, using decision tree, to show whether Educonsult should invest in RFL or in the money market. **(16 marks)**

Notes: (i) a fully annotated decision tree is required.
(ii) show calculations to the nearest ₦million

b) Give a critical assessment of the use of expected value criterion in capital investment analysis. **(4 marks)**

(Total: 20 marks)

Question 3

You are the newly appointed Chief Financial Officer (CFO) of PureGlow Cosmetics Ltd, a fast-growing Nigerian cosmetics and personal care company headquartered in Lagos.

PureGlow built its brand by marketing itself as "Nigeria's First All-Natural Beauty Brand" and heavily promotes its use of locally sourced, organic, chemical-free ingredients from farms in Oyo, Plateau, and Taraba States.

The company's customer base includes middle-class and affluent Nigerians in major cities, as well as a growing diaspora market (especially the UK and US).

PureGlow is finalising a major deal to raise ₦5billion in funding through a dual strategy:

i. private placement to institutional investors in Nigeria (e.g., pension funds, asset managers); and

ii. Small-scale crowdfunding from loyal customers under new SEC guidelines.

As part of preparations, the company's marketing materials proudly state that "all products are free from harmful chemicals like parabens, formaldehyde, and hydroquinone", substances banned or restricted by NAFDAC (National Agency for Food and Drug Administration and Control).

Situation:
During an internal audit of supplier contracts and raw material certificates, you discover serious issues:

i. One of PureGlow's most popular skin-lightening creams was recently reformulated using an imported ingredient that contains low levels of hydroquinone.

ii. Hydroquinone is regulated in Nigeria, products containing more than 2% require special labeling and approval, and continuous use can cause skin damage.

iii. The COO and Head of Procurement deliberately avoided applying for new NAFDAC certification for the reformulated cream to avoid costly delays.

iv. So far, no customer complaints have been officially recorded, but a few social media posts have started to mention "strong reactions" after using the cream.

You also learn that the Board is under intense pressure to close the funding deal quickly, and disclosing this information could delay or derail investor commitments.

When you raised your concerns with the CEO privately, he told you:

"Let's keep this internal for now. After the fundraising, we can fix the formula quietly. No need to alarm everyone when it is not even certain that regulators will investigate."

Required:

a) Identify and discuss the main ethical and corporate responsibility (CR) issues that arise in this situation. **(10 marks)**

b) Recommend the course of action you, as CFO, should take, justifying your advice.

(10 marks)

(Total: 20 marks)

Question 4

Alice Plc operates a successful chain of furniture retail stores. For the year that has just ended, the company reported after-tax profits of ₦250 million. The company has 200 million ₦0.50 shares in issue and has a P/E ratio of 7.8 times. Some years ago, in an effort to encourage sales, the company created a subsidiary company, Kolade, to hire hire purchase facilities to customers wishing to buy its more expensive furniture items. The subsidiary has grown steadily and now offers hire purchase facilities to customers of other retailers as well as to Alice customers. For the years that has just ended, the subsidiary contributed ₦3O million of the total after-tax profits of Alice.

Alice is now considering a demerger and a separate Stock Exchange listing for the subsidiary. The financial advisers of Alice have suggested that Femila should be floated with a share capital of 40 million of ₦0.50

ordinary shares and that the shareholders of Alice should receive one share in Femila for every 5 shares held. The financial advisers expect that the P/E ratio of the newly listed company will be somewhere between 12 and 14 times. The P/E ratio of Alice is expected to reduce to 7.0 times as a result of the demerger. Ignore taxation.

Required:

a) Distinguish between a divestment and a demerger. **(3 marks)**

b) Discuss the possible advantages and disadvantages of a demerger for the shareholders of a company. **(5 marks)**

c) Calculate the likely effect of the demerger on the wealth of a shareholder holding 5,000 ordinary shares in Alice, assuming that the P/E of Femila will be:

   i) at the lower end; and

   ii) at the higher end of the financial advisers' expectations and comment on you. findings. **(12 marks)**

(Total: 20 marks)

SECTION C: OPEN-ENDED QUESTIONS .

INSTRUCTION: YOU ARE REQUIRED TO ATTEMPT ANY TWO OUT OF THE THREE QUESTIONS IN THIS SECTION (30 MARKS)

Question 5

Explain how business risk and financial risk are related; and how risk mitigation and risk diversification can form part of a company's risk management strategy. **(15 marks)**

Question 6

a) Explain the differences between investors who are risk averse, risk neutral and risk loving, giving examples where possible. **(6 marks)**

b) You are provided with the following details concerning three stocks X, Y, Z.

Stock	Current Price	Expected Price	Expected Dividend	Beta
X	40	48	2.00	1.8
Y	22	24	0.75	0.8
Z	37	38	0.85	0.5

i) Assume stocks X and Y are currently priced according to the CAPM. What is the risk-free rate, the market risk premium and the expected return of the market portfolio?

ii) If stocks X and Y are correctly priced according to the CAPM, is stock Z over or undervalued? Explain what should stock Z's current price be according to the CAPM? **(9 marks)**

(Total: 15 marks)

Question 7

LuminTech, a medium-sized technology company, specialises in producing high-quality solar panels for residential and commercial buildings. The company has grown steadily over the past decade but is now facing intensified competition in the renewable energy sector. To maintain its competitive edge, LuminTech's management is considering several strategic initiatives:

a) **Increasing debt financing**: To fund an aggressive R&D project aimed at developing a next-generation solar panel with significantly higher efficiency.

b) **Launching a CSR programme**: Aiming to offset carbon emissions generated from their manufacturing process, LuminTech is exploring options for partnerships with environmental organisations and plans to adopt greener manufacturing practices.

c) **Improving employee welfare**: There has been recent turnover among R&D staff, so management is considering offering better benefits, training, and wellness programmes to attract and retain talent.

d) **Enhancing customer service**: Feedback has indicated that customers are dissatisfied with post-purchase support. LuminTech is contemplating an investment in a customer service team to improve the experience and reduce product returns.

Current financial situation

LuminTech has a debt-to-equity ratio of 0.5 and a strong cash reserve. Shareholders have shown some concern over LuminTech's recent dip in profit margins due to rising manufacturing costs. The company is also privately held, with a mix of short-term-focused investors and those who prioritise long-term value.

Required:

As a financial advisor to LuminTech, assess each of the proposed strategic initiatives from the perspective of shareholder wealth maximisation. How should the company balance these objectives with its aim of maximising shareholder value? **(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

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

Modified Internal Rate of Return

$$MIRR = \left[\frac{PV_R}{PV_I}\right]^{\frac{1}{n}}(1 + r_e) - 1$$

The Black-Scholes Option Pricing Model

$C_0 = S_0N(d_1) - Ee^{-rt}N(d_2)$

$$d_1 = \frac{\ln\left(\frac{S_0}{E}\right) + (r + 0.5\sigma^2)T}{\sigma\sqrt{T}}$$

$d_2 = d_1 - \sigma\sqrt{T}$

The Put Call Parity

$C + Ee^{-rt} = S + P$

Annuity Table

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

Where r = discount rate

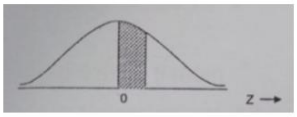
n = number of periods

Period (n)	*Discount rate* (r)										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0·990	0·980	0·971	0·96	0·95	0·943	0·935	0·92	0·917	0·90	1
2	1·970	1·942	1·913	1·88	1·85	1·833	1·808	1·78	1·759	1·73	2

3	2·941	2·884	2·829	2·77	2·72	2·673	2·624	2·57	2·531	2.48	3
4	3·902	3·808	3.717	3·63	3.54	3.465	3·387	3·31	3·240	3·17	4
5	4·853	4·713	4·580	4·45	4·32	4·212	4·100	3·99	3.890	3·79	5
6	5·795	5·601	5·417	5·24	5·07	4·917	4·767	4·62	4.486	4·35	6
7	6·728	6.472	6·230	6·00	5·78	5·582	5·389	5·20	5·033	4·86	7
8	7·652	7·325	7·020	6·73	6·46	6·210	5·971	5·74	5·535	5·33	8
9	8·566	8·162	7·786	7.43	7·10	6·802	6·515	6·24	5·995	5·75	9
1	9·471	8·983	8·530	8·11	7·72	7·360	7·024	6·71	6.418	6·14	10
1	10·368	9·787	9·253	8·76	8·30	7·887	7.499	7·13	6·805	6.49	11
1	11·255	10·57	9·954	9·38	8·86	8·384	7·943	7·53	7'161	6·81	12
1	12·134	11·34	10·635	9·98	9·39	8·853	8·358	7·90	7·487	7·10	13
1	13·004	12·10	11·296	10·56	9·89	9·295	8·745	8·24	7·786	7·36	14
1	13·865	12·84	11·938	11·11	10·38	9·712	9·108	8·55	8·061	7·60	15

(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0·901	0·893	0·885	0·87	0·87	0·862	0·855	0·84	0·840	0·83	1
2	1·713	1·690	1·668	1·64	1·62	1·605	1·585	1·56	1·547	1·52	2
3	2.444	2.402	2·361	2·32	2·28	2·246	2·210	2·17	2·140	2·10	3
4	3·102	3·037	2·974	2·91	2·85	2·798	2·743	2.69	2·639	2.58	4
5	3·696	3·605	3·517	3·43	3·35	3·274	3·199	3·12	3·058	2·99	5
6	4·231	4·111	3·998	3·88	3·78	3·685	3·589	3.49	3.410	3·32	6
7	4·712	4·564	4.423	4·28	4·16	4·039	3·922	3·81	3·706	3·60	7
8	5·146	4·968	4.799	4·63	4.48	4·344	4·207	4·07	3·954	3·83	8
9	5·537	5·328	5·132	4·94	4·77	4·607	4.451	4·30	4·163	4·03	9
1	5·889	5·650	5.426	5·21	5·01	4·833	4·659	4.49	4·339	4·19	10
1	6·207	5·938	5·687	5.45	5·23	5·029	4·836	4·65	4.486	4·32	11
1	6·492	6·194	5·918	5·66	5·42	5·197	4·988	4·79	4·611	4.43	12
1	6·750	6.424	6·122	5·84	5·58	5·342	5·118	4·91	4·715	4·53	13
1	6·982	6·628	6·302	6·00	5·72	5.468	5·229	5·00	4·802	4·61	14
1	7·191	6·811	6.462	6·14	5·84	5·575	5·324	5·09	4·876	4·67	15

Standard normal distribution table



	0·00	0·01	0·02	0·03	0·04	0·05	0·06	0·07	0·08	0·09
0·0	0·0000	0·0040	0·0080	0·0120	0·0160	0·0199	0·0239	0·0279	0·0319	0·0359
0·1	0·0398	0·0438	0·0478	0·0517	0·0557	0·0596	0·0636	0·0675	0·0714	0·0753
0·2	0·0793	0·0832	0·0871	0·0910	0·0948	0·0987	0·1026	0·1064	0·1103	0·1141
0·3	0·1179	0·1217	0·1255	0·1293	0·1331	0·1368	0·1406	0·1443	0·1480	0·1517
0.4	0.1554	0·1591	0·1628	0·1664	0·1700	0·1736	0·1772	0·1808	0·1844	0·1879
0·5	0·1915	0·1950	0·1985	0·2019	0·2054	0·2088	0·2123	0·2157	0·2190	0·2224
0·6	0·2257	0·2291	0·2324	0·2357	0·2389	0·2422	0·2454	0·2486	0·2517	0·2549
0·7	0·2580	0·2611	0·2642	0·2673	0·2704	0·2734	0·2764	0·2794	0·2823	0·2852
0·8	0·2881	0·2910	0·2939	0·2967	0·2995	0·3023	0·3051	0·3078	0·3106	0·3133
0·9	0·3159	0·3186	0·3212	0·3238	0·3264	0·3289	0·3315	0·3340	0·3365	0·3389
1·0	0·3413	0·3438	0·3461	0·3485	0·3508	0·3531	0·3554	0·3577	0·3599	0·3621
1·1	0·3643	0·3665	0·3686	0·3708	0·3729	0·3749	0·3770	0·3790	0·3810	0·3830
1·2	0·3849	0·3869	0·3888	0·3907	0·3925	0·3944	0·3962	0·3980	0·3997	0.4015
1·3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1·5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1·6	0.4452	0.4463	0.4474	0.4484	0·4495	0.4505	0.4515	0.4525	0.4535	0.4545
1·7	0.4554	0.4564	0.4573	0·4582	0·4591	0.4599	0·4608	0·4616	0.4625	0.4633
1·8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0·4706
1·9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2·0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0·4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0·4850	0.4854	0.4857
2·2	0.4861	0.4864	0.4868	0·4871	0.4875	0.4878	0.4881	0·4884	0.4887	0.4890
2·3	0.4893	0·4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2·4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0·4931	0.4932	0.4934	0.4936
2·5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2·6	0.4953	0.4955	0·4956	0.4957	0.4959	0.4960	0.4961	0·4962	0.4963	0·4964
2·7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0·4974
2·8	0.4974	0.4975	0.4976	0.4977	0.4977	0·4978	0.4979	0.4979	0.4980	0.4981
2·9	0·4981	0.4982	0.4983	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0·4986
3·0	0·4987	0.4987	0·4987	0.4988	0.4988	0.4989	0.4989	0·4989	0.4990	0·4990

This table can be used to calculate N(d), the cumulative normal distribution functions needed for the Black-Scholes model of option pricing. If $d_i > 0$, add 0·5 to the relevant number above. If $d_i < 0$, subtract the relevant number above from 0·5.

SUGGESTED SOLUTIONS

Solution 1

ai) **Current WACC**

i. Cost of equity – using CAPM

$K_E = 42 + 0.6\ (8 - 2) = 5.6\%$

Total value of equity: 233/0.10 × 2.76 = ₦6,431m

ii. Cost redeemable bonds

- Using face value of ₦100

We need the IRR of the following related cash flows:

Year 0 Current market value = (108)

Year 1- 4 Interest, net of tax = ₦6 × (1 – 0.2) = 4.8

Year 4 Redemption value = 100

We can make use of the following approximate internal rate of return (AIRR) method to determine the first trial rate.

$$\text{Approximate IRR} = \left(I + \frac{R - P}{n}\right) \div \frac{R + P}{2}, \text{where}$$

AIRR = approximate IRR

I = annual interest, net of tax = 4.8

R = the redemption value = 100

P = current market price = 108

n = number of years to redemption = 4

$$\text{AIRR} = \left(4.8 + \frac{100 - 108}{4}\right) \div \left(\frac{100 + 108}{2}\right) = 2.69\%$$

So, try 2.69%

Yr	CF ₦	PVF at 2.69%	PV ₦
0	(108)	1	(108)
1- 4	4.8	3.745	17.976
4	100	0.899	89.90
NPV			-0.124

For all practical purposes and with NPV of -0.124, it is not necessary to try another rate. The IRR is approximately 2.69% and it is the cost of the bonds.

iii. Total market value

1,900m × 108/100 = ₦2,052

iv. Bank loan

Cost of debt = 4% (1 – 0.2) = 3.2%

Total value is taken as the book value = ₦635

v. WACC

Capital	**Total market Value ₦m**	**Cost**	**Hash total ₦m**
Equity	6,431	0.054	347.27
Bonds	2,052	0.0269	51.20
Bank loan	635	0.032	20.32
	9,118		418.79

WACC = 418.79/9118 = 4.59%

aii) **Using Gordon Growth Model**

The use of the Gordon model only affects the calculation of cost of equity

vi. Growth rate in dividend (g)

g = ROE × b

b = retention rate

Dividends = VPS × DY

= ₦2.76 × 0.042 = ₦0.1159

Dividend payout ratio = DPS/EPS

= 0.1159/0.25 = 46.37%

Retention rate = b = 1 – 0.4637 = 53.63%

vi. ROE = return on equity

= PAT/ opening shareholders fund

PAT = EPS × No. of shares in issue

= ₦0.25 × 233/0.10 = ₦582.50m

Computing opening shareholders fund

	₦m	₦m
Closing shareholders funds		5,263
Total PAT for the year	582.50	
Less dividend for the year = 0.1159 × 233/0.10 =	270.05	
Earnings retained for the year		312
Opening shareholders funds		4951

ROE = ₦582.50/4951 = 11.77%

Growth rate (g) ROE × b = 11.77 × 0.536 = 6.3%

$$K_E = \frac{D_0(1+g)}{V_E} + g = \frac{0.1159(1.063)}{2.76} + 0.063 = 10.76\%$$

vii. Revised WACC

Capital	Total Mkt Value ₦m	Cost	Hash total ₦m
Equity	6,431	0.1076	691.98
Bonds	2,052	0.0269	55.20
Bank loan	635	0.032	20.32
	9,118		767.50

WACC = 767.50/9118 = 8.42%

b) The cost of equity should be adjusted to reflect the systematic risk of the new project. The beta factor for the holiday travel industry should be adjusted for gearing. Degearing the equity beta (β_E) gives:

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

$$= \frac{1.4 \times 5}{5 + 3(1-0.2)} + 0 = 0.95$$

Regear the asset beta to reflect Frank's gearing

$$\beta_E = \beta_A + (\beta_A - \beta_D)(D/E)(1-t)$$

= 0.95 + (0.95 – 0) (2687*/6431)(1 – 0.2) = 1.27

(* = total value of bonds and bank loan)

K_E = 2 + 1.27(8 - 2) = 9.62%

This is the cost of equity that reflects the **systematic risk of the project and the financial risk of the company.**

c) If the diversification goes ahead the cost of equity will reflect the systemic risk of both divisions.

The weighted average beta of the enlarged group = (1.27 × 0.10) + (0.6 × 0.90) = 0.667

K_E = 2 + 0.667 (8 - 2) = 6.002% or (say) 6%.

The new WACC is computed as follows:

WACC = (6% × 6431 + 2.69% × 2052 + (3.2% × 635)/9118) = 5.06%

The implications of a permanent change in the company's WACC from 4.59% to 5.06% are less clear. An increase in the WACC is usually associated with reductions in value, on the other hand assuming that the new project has a positive net present value this could result in an increase in the market capitalisation.

d) The diversification plan may not be welcomed by the market because rational investors should already be well diversified, in order to eliminate unsystematic risk. If shareholders are not well diversified this may be achieved quickly and cheaply through the purchase of such investments as general unit trusts. The expense of the company undertaking diversification is likely to be much greater than that of individual investors in the company diversifying themselves, and therefore a sub-optimal strategy from investors' viewpoint. There is evidence in practice that conglomerate companies often trade at a discount.

e) If there is a significant change in gearing it is not appropriate to use WACC/NPV to appraise the project. Instead APV should be used.

The discount rate will be that of an all-equity company using the asset beta of 0.95 to reflect the systematic risk. The discount rate will be: 2 + 0.95(8 - 2) = 7.7%. This will be used to calculate the base case NPV. This will then be adjusted for the benefits and costs of the actual way that the project has been financed.

Solution 2

a) If the funds are invested in the money market the investment will have a net present value of zero as the market is said to be efficient.
If the funds are invested with RFL and with a cost of capital of 18%, the discount factor for cash flows arising at the end of year one is 0.847 and, at the end of year two 0.718. The present values of the cash flows are detailed below (in ₦ million).

Year 1			Year 2		
Prob	**Cash Flow**	**PV**	**Prob**	**Cash Flow**	**PV**
0.6	160	136	0.6	160	115
			0.4	180	129
0.4	200	169	0.6	200	144
			0.4	220	158

The PV of the terminal cash flows are
Year 1 282 × 0.847 = 239
Year 2 162 × 0.718 = 116

The above present values are used to construct the decision tree.

Decision Tree – All Figures in ₦ million

Workings (₦ million)

Point A: EV = 0.6 (115 + 116) + 0.4 (129 + 116) = 237

Point B: EV = 0.6 (144 + 116) + 0.4 (158 + 116) = 266

Point C: It is better to abandon at the end of year 1 (EV = 239) rather than to continue (EV = 237). Thus, the value at point E is 239

Point D: It is better to continue to year 2 (EV = 266) rather than abandon (EV =239)

Point E: EV = 0.6 (136 + 239) + 0.4 (169 + 266) = 399

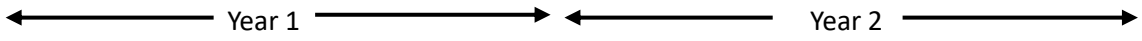
Point F: Money market: NPV = 0

RFL: NPV = 399 – 402 = - 3

Recommendation: In the absence of any other alternative use of the funds, investment in the money market is recommended as it will avoid the loss of

-

NPV = -3



₦3,000,000 if invested in RFL.

b) The expected value (EV) criterion is a common method used in capital investment analysis to evaluate projects under uncertainty by calculating the weighted average of all possible outcomes, using their probabilities. While useful, it has several critical limitations:

Strengths of expected value criterion

a. **Simplicity and clarity**
   EV provides a straightforward and quantitative way to compare different investment alternatives.

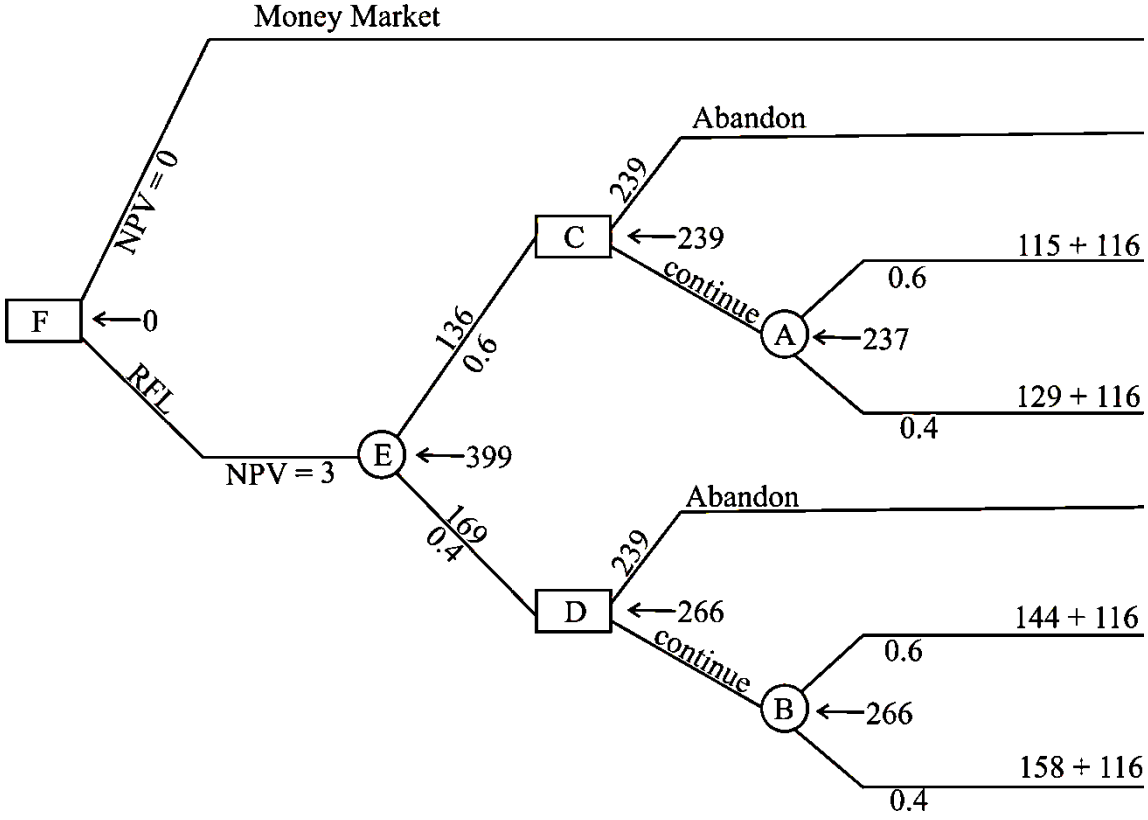
b. **Objective decision rule**
   It avoids subjective biases by relying on probability-weighted outcomes, promoting rational decision-making.

c. **Useful for repeated decisions**:
   Over a large number of similar investment decisions, EV helps identify strategies that maximise long-term gains.

Critical limitations

a. **Ignores risk and variability**
   EV does not account for the risk or variability of outcomes. Two projects with the same EV can have vastly different risk profiles.

b. **Not suitable for one-time projects**
   For non-repetitive or high-stakes projects, relying on EV may be misleading because the investor will experience only one actual outcome, not the average of many.



c. **Assumes risk neutrality**
The EV criterion assumes that decision-makers are risk-neutral, which is often unrealistic. Most investors are risk-averse and prefer more certain returns.

d. **Relies on accurate probabilities**
The usefulness of EV depends on the accuracy of the assigned probabilities. In practice, these are often estimates or guesses, leading to potential errors.

e. **Overlooks strategic and flexible decisions**
EV does not incorporate the value of managerial flexibility (e.g., the option to delay, expand, or abandon a project), which is better handled by real options analysis.

f. **Ethical and practical implications**:
EV may favour decisions with high potential gains but also significant potential losses, which could be ethically or operationally unacceptable, especially in public or socially sensitive investments.

Conclusion:
While the expected value criterion is a valuable tool in capital investment analysis, it should not be used in isolation. It works best when complemented by other methods, such as senitivity analysis, scenario analysis, risk-adjusted discount rates, or real options analysis, that address risk, uncertainty, and investor preferences.

Solution 3

a) **Ethical and corporate responsibility issues**
   i. **Consumer protection risk**
      a. Pure Glow markets its products as "free from harmful chemicals," yet a major product contains a regulated substance (hydroquinone).
      b. This puts consumer health at risk, violating ethical obligations to protect customers.
   ii. **Regulatory compliance risk**
      a. Avoiding NAFDAC re-certification breaches regulatory obligations.
      b. If discovered, it could lead to regulatory sanctions, product recalls, fines, and brand destruction.
   iii. **Investor deception**
      a. Investors are relying on claims that PureGlow's products are natural and compliant.
      b. Concealing material regulatory breaches during a fundraise can amount to securities fraud under Nigerian SEC rules.
   iv. **Brand and reputation risk**
      a. PureGlow’s brand value is built on natural, safe products.

b. A scandal involving hydroquinone could permanently damage customer trust and destroy the brand's premium pricing ability.

v. **Professional and personal integrity**

a. As CFO and a finance professional, I am bound to act with integrity, objectivity, and in public interest.

b. Silence would implicate me in unethical and possibly illegal conduct, endangering my career, professional membership, and even legal exposure.

b) **Recommended course of action**

i. **Immediate escalation to full board**

a. Demand a formal Board discussion and full disclosure of the issue.

b. Document all concerns raised and advice given to protect professional liability.

ii. **Legal and Regulatory Consultation**

a. Seek immediate advice from regulatory counsel on PureGlow's obligations to NAFDAC and SEC investors.

b. Advise the Board to self-report the breach to NAFDAC to mitigate penalties.

iii. **Full Transparency with Investors**

a. Recommend proactive disclosure to major investors, framing it as a quality control issue being addressed.

b. Emphasise that addressing it early protects brand value and reduces future litigation risk.

iv. **Urgent Product Reformulation and Testing**

a. Begin reformulation immediately and reapply for proper NAFDAC certification.

b. Offer to recall affected products if necessary or label them appropriately pending reformulation.

v. **Strengthen quality assurance processes**

a. Propose a full internal review of procurement, production, and certification processes to prevent recurrence.

b. Institute mandatory compliance reporting for any product ingredient changes.

vi. **Whistleblowing option if necessary**

a. If management refuses to act ethically, escalate externally through protected whistleblowing channels (e.g., SEC, NAFDAC).

b. Protect yourself legally by consulting professional bodies (e.g., ICAN, ACCA) and retaining documented evidence.

Conclusion

The ethical path is clear: consumer safety, regulatory compliance, and investor trust must not be sacrificed for short-term fundraising success.

Transparency and proactive corrective action offer PureGlow the best chance of surviving this crisis while staying true to its ethical brand promise.

Solution 4

a) **Distinction between a divestment and a demerger**

a. **Dnvestment** refers to the process by which a company sells off a part of its business (a subsidiary, asset, or business unit) to an external buyer. The proceeds from the sale go to the parent company, and the unit sold no longer forms part of the group.

b. **Demerger** involves separating a subsidiary or part of the company into a new independent entity, often by distributing shares in the new entity to the parent company's shareholders. No sale occurs; instead, ownership is passed directly to existing shareholders.

b) **Advantages and disadvantages of a demerger for shareholders**

Advantages

a. **Unlocking value**: If the subsidiary has a higher growth potential or warrants a higher P/E ratio, it may be more fairly valued on its own.
b. **Focus**: Each entity can focus on its core competencies, potentially improving management efficiency and performance.
c. **Tailored investment**: Shareholders can choose to retain or sell shares in the new company depending on their preferences and risk appetite.
d. **Improved transparency**: Investors may find it easier to value each business separately.

Disadvantages

a. **Uncertainty**: New entities might face initial operational or market risks post-demerger.

b. **Costs**: Demergers can incur legal, administrative, and restructuring costs.

c. **Loss of synergies**: Existing synergies between divisions may be lost.

d. **Share price volatility**: Share prices of both companies may be volatile immediately after the demerger.

c) **Effect of the demerger on shareholder wealth**

Current value of Alice shares:

i. Total after-tax profit = ₦250 million

ii. P/E ratio = 7.8

iii. Total value of Alice Plc = ₦250m × 7.8 = ₦1,950 million

iv. Number of shares = 200 million

v. Price per share = 1,950m / 200m = ₦9.75

vi. Value of 5,000 shares = 5,000 × 9.75 = ₦48,750

Post-demerger figures:

Profits:

i. Alice (after demerger) = 250m – 30m = ₦220 million

ii. Femila (subsidiary) = ₦30 million

Alice post-demerger:

i. P/E = 7.0

ii. Value = 220m × 7.0 = ₦1,540 million

iii. Value per share = 1,540m / 200m = ₦7.70

Femila:

i. 40 million shares issued

ii. 1 Femila share for every 5 Alice shares → 5,000 / 5 = 1,000 Femila shares

i) **If Femila P/E = 12:**

i. Value = 30m × 12 = ₦360 million

ii. Price per Femila share = 360m / 40m = ₦9.00

iii. Value of 1,000 shares = 1,000 × 9 = ₦9,000

Total Post-Demerger Value = Alice shares + Femila shares =
= (5,000 × 7.70) + 9,000 = ₦38,500 + ₦9,000 = ₦47,500

Change in Wealth = 48,750 – 47,500 = -₦1,250 (a small decrease)

ii) **If Femila P/E = 14:**

i. Value = 30m × 14 = ₦420 million

ii. Price per Femila share = 420m / 40m = ₦10.50

iii. Value of 1,000 shares = 1,000 × 10.50 = ₦10,500

Total post-demerger value = Alice + Femila =
= (5,000 × 7.70) + 10,500 = ₦38,500 + ₦10,500 = ₦49,000

Change in Wealth = 49,000 – 48,750 = +₦250 (slight increase)

Comment on findings:

The demerger could slightly increase or decrease shareholder wealth depending on the P/E rating the market assigns to Femila. The range of impact is small (–₦1,250 to +₦250 for 5,000 shares),

suggesting limited financial risk to shareholders, with potential upside if Femila achieves a strong independent valuation.

Solution 5

Business risk and financial risk are closely related, as they both contribute to the overall risk profile of a company, but they stem from different sources:

Relationship between business risk and financial risk

a) **Business risk**: Business risk is the risk arising from the company's operational environment and day-to-day activities. It includes factors like fluctuations in demand, competition, regulatory changes, and operational efficiency. Business risk affects a company's ability to generate stable operating income, regardless of its capital structure.

b) **Financial risk**: Financial risk is an additional risk to shareholders due to the company's use of debt financing. It arises from obligations to service debt (interest and principal payments). The more debt a company has relating to equity, the higher its financial risk, as it has fixed financial commitments that must be met regardless of operational performance.

c) **Relationship:** Business risk and financial risk interact through the company's capital structure. High business risk combined with high financial leverage can amplify overall risk, making earnings and cash flows more volatile and potentially straining the company's ability to meet financial obligations. Conversely, in industries with low business risk (such as utilities with stable demand), companies may take on higher financial risk (more debt) without jeopardising their financial stability as significantly.

Role of risk mitigation and diversification in risk management strategy

a) **Risk mitigation**

i. Purpose: Risk mitigation aims to reduce the probability or impact of specific risks. For business risk, this could involve hedging against commodity prices, implementing strong internal controls, or diversifying product lines. For financial risk, mitigation strategies include reducing leverage, refinancing debt at favourable rates, or maintaining a cash reserve.

ii. Strategy: By actively managing and mitigating individual risks, companies can stabilise cash flows and improve resilience. For example, an airline might hedge fuel costs to limit exposure to price volatility, or a manufacturer might diversify its supplier base to avoid disruption. In financial risk, companies may cap leverage ratios or use interest rate swaps to stabilise financing costs.

b) **Risk diversification**

i. **Purpose:** Diversification aims to spread risk across different areas, such as products, markets, or asset classes, to reduce the impact of any single risk. This approach minimizes dependency on any one source of income or type of investment.

ii. **Strategy:** In terms of business risk, a company might diversify by expanding into new markets, launching new product lines, or acquiring companies in unrelated industries, which reduces exposure to industry-specific downturns. In terms of financial risk, diversification could involve holding a balanced portfolio of financial instruments or currencies to protect against market fluctuations.

Integrating mitigation and diversification into risk management strategy

Incorporating both risk mitigation and diversification allows companies to manage overall risk holistically as follows:

i. **Stabilising cash flows:** Mitigation strategies, such as hedging or fixed contracts, can protect core revenue streams, while diversification reduces reliance on any single source, ensuring more stable cash flows.

ii. **Optimising capital structure:** Diversification in capital sources (e.g., equity, debt, internal financing) helps balance financial risk, allowing the company to manage leverage without overexposing itself to interest rate risks or liquidity constraints.

iii. **Long-term resilience:** Combined, these strategies help companies respond to market volatility and economic cycles. A robust risk management strategy that includes mitigation and diversification strengthens a company's ability to withstand external shocks, enabling it to pursue growth opportunities confidently.

In summary, business risk and financial risk together shape the company's overall risk exposure. A comprehensive risk management strategy that incorporates both risk mitigation and diversification allow companies to balance operational and financial stability, paving the way for sustainable growth and strategic flexibility.

Solution 6

a) Investors can be categorised based on their attitude toward risk into three broad types: risk-averse, risk-neutral, and risk-loving (or risk-seeking). These categories reflect how investors make choices under uncertainty, particularly when faced with investments of varying risk and return profiles.

Risk-averse investors: Risk-averse investors prefer lower risk and are willing to accept a lower expected return in exchange for greater certainty or safety. They dislike uncertainty and would rather invest in something with a guaranteed return than gamble on higher but uncertain returns.

Behaviour:

i. Choose bonds or savings accounts over stocks.

ii. Diversify investments to minimise risk.

iii. Avoid speculative or volatile assets.

Example:

An investor nearing retirement might invest in government bonds or blue-chip dividend-paying stocks. For instance, they may prefer a 3% guaranteed return from a Treasury bond over a stock that might return 10% but could also lose value.

Risk-neutral investors: Risk-neutral investors are indifferent to risk. They make decisions based solely on expected return, regardless of the risk involved.

Behaviour:

i. Will choose the investment with the highest expected return, even if it involves more risk.

ii. Tend to evaluate investments analytically rather than emotionally.

Example:

A corporate treasurer deciding between projects may focus purely on net present value (NPV) or expected return, without regard to the risk level, assuming all risks are fairly priced. For example, they may be equally willing to invest in a startup or a bond, as long as the expected return is equal.

Risk-loving (risk-seeking) investors: Risk-loving investors prefer investments with higher risk, even if the expected return is the same or lower than a safer investment. They enjoy the possibility of high returns or the thrill of taking chances.

Behaviour:

i. Frequently invest in speculative assets like cryptocurrencies, options, or penny stocks.

ii. May ignore diversification principles and concentrate investments in high-volatile assets.

Example:
A young investor might put most of their money into Bitcoin or early-stage tech startups, hoping for outsised gains, even though these investments come with a high probability of loss.

Understanding risk preferences is crucial for portfolio construction, financial planning, and behavioral finance. It also helps tailor investment strategies to match an individual's goals, time horizon, and comfort with uncertainty.

b) i. Letting P_0, P_1 and D_1 denote the current price, the expected price and the expected dividend, respectively, of a stock, then the expected return of each stock is:

$$E(R) = \frac{P_1 + D_1 - P_0}{P_0}$$

This gives

$E(R_X) = \frac{48 + 2 - 40}{40}$ = 25.0%

$E(R_Y) = \frac{24.00 + 0.75 - 22.00}{22.00}$ = 12.50%

$E(R_Z) = \frac{38.00 + 0.85 - 37.00}{22.00}$ = 5.0%

If X and Y are correctly priced, then

$$E(R_X) = R_F + \beta_X[R_M - R_F]$$

$$E(R_Y) = R_F + \beta_Y[R_M - R_F]$$

We can substitute what we know and solve (letting $R_M - R_F = P$):

$25 = R_F + 1.8P$ ..... (1)

$12.5 = R_F + 0.8P$ ..... (2)

(1) – (2):12.5 = P

Substitute for P in (1)

$$25 = R_F + 1.8(12.5)$$

$$R_F = 2.5$$

Thus:

Market risk premium = $R_M - R_F$ = 12.50%

Risk-free rate = 2.50%

Expected return on market portfolio is

12.5% + 2.5% = 15%

ii) Given Z's beta, its required return should be:

2.50 + 0.5(15 – 2.50) = 8.75%

Hence Z's current price should be such that

$\frac{38.0 + 0.85 - P_0}{P_0}$ = 0.0875

$P_0 = \frac{38.85}{1.0875}$ = 35.72

This means that stock Z is currently overvalued.

Solution 7

a). **Increasing debt financing for R&D**

i. **Analysis**: Leveraging debt to finance R&D can be advantageous if the investment results in technological innovations that enhance product competitiveness and increase market share. However, it will also increase the firm's financial risk, especially if the R&D investment does not generate expected returns.

ii. **Shareholder impact**: If successful, this could lead to a long-term increase in shareholder wealth through revenue growth and enhanced brand value. However, the higher debt level may concern short-term-focused shareholders, especially if it affects LuminTech's profit margins due to interest expenses.

iii. **Recommendation**: LuminTech should weigh the benefits of this debt-financed R&D against the potential for financial distress. Management might consider a more conservative approach, such as using cash reserves or phased R&D spending, to minimise risk.

b) **Launching a CSR programme**

i. **Analysis**: A CSR initiative aligns with growing consumer interest in environmentally responsible companies. This can enhance brand reputation and potentially attract environmentally conscious customers.

ii. **Shareholder impact**: A well-managed CSR program can support shareholder wealth maximisation by reducing regulatory risks and building customer loyalty. However, there is a potential short-term cost, as implementing greener practices may initially lower profit margins.

iii. **Recommendation**: The CSR programme should be designed to balance environmental impact with cost efficiency. Management might communicate the long-term brand benefits of CSR to reassure shareholders that this investment will contribute to sustainable growth.

c) **Improving employee welfare**

i. **Analysis**: Reducing turnover and boosting morale in the R&D department is crucial for maintaining innovative capacity. While employee benefits and wellness programmes entail costs, they can significantly increase productivity and reduce the high costs associated with turnover.

ii. **Shareholder impact**: Improving employee welfare aligns with shareholder wealth maximisation by ensuring operational efficiency and retaining valuable intellectual capital, which is key to sustaining competitive advantage. In the short term, there may be a reduction in profits due to increased employee- related expenses.

iii. **Recommendation**: Management should prioritise employee welfare improvements that are likely to yield the highest retention benefits, such as competitive salaries and career development programs, which directly impact innovation and productivity.

d. **Enhancing customer service**

i. **Analysis**: Investing in customer service addresses customer satisfaction issues, potentially reducing product returns and boosting customer loyalty. This will strengthen LuminTech's brand and market position, particularly in a highly competitive sector.

ii. **Shareholder impact**: While investing in customer service can impact short- term profits, it enhances long-term shareholder wealth by reducing customer churn and increasing repeat sales. The higher costs should be offset by improved customer retention and reduced refunds/returns.

iii. **Recommendation**: LuminTech could phase in this investment gradually, assessing improvements in customer satisfaction metrics and return rates. This will allow management to adjust the level of investment based on measurable customer response and ROI.

Balancing objectives with shareholder wealth maximisation

To balance these initiatives with shareholder wealth maximisation, LuminTech should:

a. **Communicate the long-term benefits**: Management should clearly communicate the long-term value of these initiatives to shareholders, emphasising how they will support sustainable profitability and competitive positioning.
b. **Prioritise strategic investment timing**: To appease both short- and long-term shareholders, LuminTech could implement these initiatives gradually, starting with the least capital-intensive options that yield immediate benefits, such as customer service improvements.
c. **Monitor financial health**: Careful monitoring of the debt ratio and cost structure can ensure that LuminTech does not take on excessive risk while pursuing growth and stability.

This approach demonstrates how LuminTech can strategically allocate resources in ways that benefit all stakeholders and align with long-term shareholder wealth maximisation.