



PILOT PAPER

September 2015.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

The managers of Kawaida Ltd. are investigating a potential Sh.25,000,000 investment. The investment would be a diversification away from existing mainstream activities into the food manufacturing industry. Sh.6,000,000 of the investment would be financed by internal funds, Sh.10,000,000 by a rights issue and Sh.9,000,000 by long term loans. The investment is expected to generate pretax net cash flows of approximately Sh.5,000,000 per year for a period of ten years. The residual value at the end of year 10 is forecast to be Sh.5,000,000 after tax. As the investment is in an area that the government wishes to develop, a subsidised loan of Sh.4,000,000 out of the total Sh.9,000,000 is available. This will cost 2% below the company's normal cost of long term debt finance which is 8%.

Kawaida Ltd.'s equity beta is 0.85, and its financial gearing is 60% equity and 40% debt by value. The average equity beta in the food manufacturing industry is 1.2 and average gearing 50% equity and 50% debt by market value.

The risk free rate is 5.5% per annum and the market return is 12% per annum.

Issue costs are estimated to be 1% for debt financing (excluding the subsidised loan) and 4% for equity financing. These costs are not tax allowable.

The corporate tax rate is 30%

Required:

- (a) Estimate the adjusted present value (APV) of the proposed investment. (15 marks)
- (b) Comment upon the circumstances under which APV might be a better method of evaluating a capital investment than net present value (NPV). (5 marks)
- (Total: 20 marks)

QUESTION TWO

- (a) ABC Ltd., a small manufacturing firm, wishes to acquire a new machine that costs Sh.30,000.

Arrangements can be made to lease or purchase the machine. The firm is in the 40% tax bracket. The firm has gathered the following information about the two alternatives:

Purchase: ABC Ltd. can finance the purchase of the machine with a 10%, 6 year loan requiring annual end of year installments. The machine would be depreciated using the reducing balance method. It would have a salvage value of Sh.6,000 after 5 years. The company would pay Sh.1,200 per year for a service contract that covers all maintenance costs. The firm plans to keep the machine and use it beyond its 5 year recovery period.

Lease: ABC Ltd. would obtain a 5 year lease requiring annual end-of-year-lease payments of Sh.10,000.

The lessor would pay all maintenance costs. Insurance and other costs will be borne by the lessee.

ABC Ltd. would be given the right to exercise its option to purchase the machine for Sh.3,000 at the end of the lease term.

Required:

Advise ABC Ltd. on which alternative to take using suitable computations. (16 marks)

- (b) Briefly explain how the arbitrage process may lead to an equilibrium in the financial markets. (4 marks)

(Total: 20 marks)

QUESTION THREE

- (a) Briefly discuss the meaning and importance of the following terms as used in option pricing:

- (i) Delta. (2 marks)
- (ii) Theta. (2 marks)
- (iii) Vega. (2 marks)

(iv) Rho.

(2 marks)

(v) Gamma.

(2 marks)

- (b) Assume that your company has invested in 100,000 shares of Usaidizi Ltd., a manufacturer of light bulbs. You are concerned about the recent volatility in Usaidizi Ltd.'s share price due to the unpredictable weather in Uganda. You wish to protect your company's investments from a possible fall in Usaidizi Ltd. share price until winter in three months time, but do not wish to sell the shares at present.

No dividends are due to be paid by Usaidizi Ltd. during the next three months.

Market data:

- Usaidizi Ltd. current share price: Sh.20
- Call option exercise price: Sh.22
- Time to expiry: 3 months
- Volatility of Usaidizi Ltd. shares 50% (standard deviation per year)

Assume that option contracts are for the purchase or sale of units of 1,000 shares.

Required:

- (i) Devise a delta hedger that is expected to protect investment against changes in the share price until the weather changes. Delta may be estimated using $N(d_1)$. (8 marks)
- (ii) Comment on whether such a hedge is likely to be totally successful. (2 marks)

(Total: 20 marks)

QUESTION FOUR

Omena Ltd. is a firm in the manufacturing industry. The management of this company are considering purchasing a new machine at a cost of Sh.125 million. This investment is expected to reduce manufacturing costs by Sh.45 million annually. The firm will need to increase its net operating working capital by Sh.12.5 million when the machine is installed, but the required operating working capital will return to the original level when the machine is sold after 5 years.

Omena Ltd. will use the straight line method to depreciate the machines and it expects to sell the machine at the end of 5 years operating life for Sh.11.50 million. The company pays corporation taxes at the rate of 30% and uses 10% cost of capital to evaluate projects of this nature.

Required:

- (a) The project's net present value. (3 marks)
- (b) The firm's management are unsure about the annual savings in operating costs that will occur with the new machines acquisition. Management believes that these savings may deviate from their base case value (Sh.45 million) by as much as a plus or minus 10%.

Determine the net present value of the project under both situations and comment on the sensitivity of this variable. (5 marks)

- (c) Suppose the firm's chief finance officer suggest that the firm does a scenario analysis for this project because of the concerns raised about data assumptions, particularly the annual operating cost saving, the salvage value and the net operating working capital (NOWC) requirement. After an extensive analysis, she arrives with the following probabilities and values for the scenario analysis:

Scenario	Probability	Annual operating	Salvage	NOWC
		cost saving	value	
		Sh."000"	Sh."000"	Sh."000"
Worst case	0.4	36,000	9,000	15,000
Base case	0.4	45,000	11,500	12,500
Best case	0.2	54,000	14,000	10,000

Determine the project's expected net present value (ENPV), standard deviation and its coefficient of variation. (7 marks)

- (d) If net present value of this project is less than Sh.5 million; this company will be exposed to a hostile takeover. Determine the probability that this company will avoid a hostile takeover (Assume normal distribution). (5 marks)

(Total: 20 marks)

QUESTION FIVE

- (a) In relation to corporate restructuring and re-organisation, distinguish between the term "demerger" and "spin off".

(3 marks)

- (b) ABC Ltd.'s investment fund comprises of four major projects, details of which are as follows:

Stock	Number of shares	Market price per share	Expected return (%)	Standard deviation of return	Correlation with market
A	2,000,000	30	10	15	0.55
B	1,000,000	25	18	20	-0.75
C	2,000,000	20	15	14	0.84
D	3,000,000	25	13	18	-0.62

The risk free rate of return is 5% and the probability distribution of a market portfolio return are given as follows:

Probability	Forecasted return of market %
0.2	15
0.15	10
0.30	15
0.25	20
0.10	25

The variance of return of the market portfolio is 169%.

Required:

- (i) Using portfolio theory, evaluate whether this portfolio is super-efficient, efficient or inefficient. (6 marks)
- (ii) Using the capital asset pricing model (CAPM), advise whether management of this company should change the composition of their portfolio or not. (6 marks)
- (c) State and explain any three conceptual differences between portfolio theory and the capital asset pricing model (CAPM). (5 marks)

(Total: 20 marks)