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CIFA PART II SECTION 4
PORTFOLIO MANAGEMENT

FRIDAY: 24 May 2019.

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

- (a) Describe three investment processes in relation to the investment policy statement (IPS). (6 marks)
- (b) A study by Celtic mutual fund has revealed the following data in respect of three securities:

Security	Standard deviation, σ (%)	Correlation with market index, ρ
A	20	0.60
B	18	0.95
C	12	0.75

The standard deviation of market portfolio is observed to be 15%.

Required:

Calculate the following:

- (i) Beta of the portfolio consisting of equal investment in each security. (3 marks)
- (ii) The systematic risk of the portfolio. (2 marks)
- (iii) The unsystematic risk of the portfolio. (4 marks)
- (c) The following information relates to five portfolios managed by Saraya Mutual Fund Ltd.:

Portfolio	Expected return (ER) (%)	Variance (σ^2)
1	10.0	0.0256
2	14.0	0.0484
3	11.20	0.0169
4	16.80	0.0625
5	19.30	0.0289

Additional information:

- The expected return of the market is 13%.
- The standard deviation of the market return is 16%.
- The risk-free rate of return is 6%.

Required:

- (i) Using the capital asset pricing model (CAPM), determine which of the above portfolios are over-valued or under-valued. (4 marks)
- (ii) Based on the result in (c) (i) above, advise an investor who is considering buying or selling a security. (1 mark)

(Total: 20 marks)

QUESTION TWO

- (a) (i) Examine three ways in which value at risk (VaR) and stress-testing techniques could be applied in assessing capital adequacy in growth firms. (3 marks)
- (ii) Elizabeth Mutesi works in the risk management department of a mutual fund and uses the variance-covariance method to estimate the weekly value at risk (VaR) for a fund. She assumes returns are normally distributed and uses a Z-value of 1.65 for a 5% probability.

Summary statistics and capital market expectations are provided below:

	Developed market bonds	Developed market equities
	(%)	(%)
Target portfolio weight	60	40
Expected annual return	8	14
Expected annual standard deviation	10	16
Expected correlation between the developed market bonds and developed market equities	0.50	
Portfolio beta	0.78	
Portfolio size	Sh.100 million	
Assume one year has 52 weeks		

Required:

The 5% weekly VaR in shillings using the variance-covariance method. (6 marks)

- (b) The universe of available risky securities consists of a large number of shares, identically distributed with expected return of 15%, standard deviation of 60% and a common correlation coefficient of 0.5. The Treasury bill yield is at 10%.

Hint:

$$\sigma_p = \left[\sigma^2/n + p \times \sigma^2 (n-1)/n \right]^{1/2}$$

Where: n is number of shares

p is correlation coefficient

σ is standard deviation

Required:

- (i) Determine the smallest number of shares necessary to generate an efficient portfolio with a standard deviation equal to or smaller than 43%. (2 marks)
- (ii) The slope of the capital market line (CML). (3 marks)
- (c) A financial analyst gathered the following data relating to Zeldic fund:

Information ratio (IR)	0.25
Benchmark Sharpe ratio	0.30
Benchmark total risk	20%

Required:

- (i) The optimal level of active risk for an investor in Zeldic fund. (3 marks)
- (ii) The total excess return for the investor in Zeldic fund. (3 marks)

(Total: 20 marks)

QUESTION THREE

- (a) Explain how the following biases could affect investors in the context of behavioural finance:

- (i) The narrative fallacy. (2 marks)
- (ii) Framing bias. (2 marks)
- (iii) Self-serving bias. (2 marks)

- (b) (i) Explain the term “tax alpha” as used in private wealth management. (2 marks)
- (ii) Johnson Masinde is advising two clients on matters relating to tax on their portfolios.

Client 1: The client lives in a tax jurisdiction with a flat tax rate of 30% which applies to all types of income and is taxed annually. The client expects to earn 10% per year on his investment over a 20 year time horizon and has an initial portfolio of Sh.1 million.

Client 2: The client expects to earn 10% per year on his investment over a 20 year time horizon and has an initial portfolio of Sh.1 million. The returns come in the form of deferred capital gain that are not taxed until the end of the 20 years. The capital gain tax is 5%.

Required:

For each client:

- (i) Calculate the expected wealth at the end of 20 years. (4 marks)
- (ii) Determine the proportion of potential investment gains consumed by taxes. (4 marks)
- (c) The following information relates to Bidii College Endowment fund:

Type of investor	:	Institutional endowment
Purpose	:	Provide annual scholarship totalling Sh.39.5 million.
Asset base	:	Sh.1 billion.
Stated return desire	:	6% calculated as a spending rate of 4% plus previously expected college tuition inflation of 2%.
Other return factors	:	Revised expectation of college tuition inflation is 3%.
Tax concerns	:	Tax exempt.

Required:

Discuss the following appropriate client objectives for the endowment fund:

- (i) Risk. (2 marks)
- (ii) Return. (2 marks)

(Total: 20 marks)

QUESTION FOUR

- (a) In relation to active portfolio management, analyse three factors that could determine the information ratio (IR). (3 marks)
- (b) Smoothline Fund invests in three asset classes namely; domestic equities, domestic bonds and international equities.

The asset allocation weights of Smoothline Fund and the expected performance of each asset class and the benchmark are shown below:

Asset class	Portfolio weight (w_{p1}) (%)	Benchmark weight (w_{B1}) (%)	Portfolio return $E(RR)$ (%)	Benchmark return (ER_{B1}) (%)
Domestic equities	45	40	11	12
Domestic bonds	30	30	6	5
International equities	25	30	14	12

Required:

The expected active return for the portfolio. (4 marks)

- (c) Rosaline Awuor is a young ICIFA graduate who finalised her studies three years ago and started a small practice as an independent financial advisor. However, her firm does not handle client’s money but only offers consultancy advisory services to her clients. Upon successful sourcing of a client, she proceeds to recommend and place the client with a fund manager or investment firm on which she earns structured agency commission on that account.

One of Rosaline’s client, Douglas Kogi, is evaluating two investment managers who have the following characteristics:

Manager X: Follows 100 stock index with annual forecast and information co-efficient (IC) of 0.076.

Manager Y: Follows 500 stock index with an annual forecast and IC of each forecast is half as much of Manager X's security forecast.

Required:

- (i) The information ratio (IR) for Manager X and Manager Y. (2 marks)
- (ii) Advise Roseline on the manager to recommend based on your answer in (c) (i) above. (1 mark)
- (iii) Evaluate four ethical issues that Roseline is likely to encounter in the course of her duties as an independent financial adviser. (4 marks)

(d) An investor purchased Sh.10,000 of a mutual fund's shares.

The fund had the following total returns over a three year period; +5%, -8%, +12%.

Required:

- (i) The fund's holding period return (HPR). (1 mark)
- (ii) The fund's geometric mean. (1 mark)

(e) Alex Kubasu intends to buy 1,000 shares of Vini Limited at a purchase price of Sh.100 each. The annual dividend per share (DPS) is Sh.2.00. The share price after one year is projected to be Sh.110 per share. The initial margin requirement is 40%, the call money rate is 4% and the commission per share is Sh.0.05.

Required:

The investor's return on the margin transaction. (4 marks)
(Total: 20 marks)

QUESTION FIVE

- (a) Evaluate four ways in which behavioural biases could affect portfolio construction. (8 marks)
- (b) In relation to mutual funds:
 - (i) Distinguish between an "open-end mutual fund" and a "closed-end mutual fund". (2 marks)
 - (ii) Describe two types of fees charged by mutual funds. (2 marks)
- (c) Philip Mwea, an investment analyst at Pritz Fund Management (PFM) is valuing two equity markets. Market A is a developed market while Market B is an emerging market.

Additional information:

- 1. Sharpe ratio of the global investable portfolio 0.29
- 2. Standard deviation of the global investable portfolio 9%
- 3. Risk-free rate of return 5%
- 4. Degree of market integration for Market A 80%
- 5. Degree of market integration for Market B 65%
- 6. Standard deviation of Market A 17%
- 7. Standard deviation of Market B 28%
- 8. Correlation of Market A with global investable portfolio 0.82
- 9. Correlation of Market B with global investable portfolio 0.63
- 10. Estimated illiquidity premium for Market A 0.0%
- 11. Estimated illiquidity premium for Market B 2.3%

The investor's time horizon is five years.

Required:

- (i) Assets expected returns. (4 marks)
- (ii) Asset beta for each market. (2 marks)
- (iii) Covariance of the two equity markets. (2 marks)

(Total: 20 marks)