



**CIFA PART III SECTION 6  
ADVANCED PORTFOLIO MANAGEMENT**

**FRIDAY: 27 November 2020.**

**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) Explain three sources of generating income from an equity investment portfolio. (3 marks)
- (b) On Wednesday, the share price of Takuzi Ltd. closed at Sh.50 per share. On Thursday morning before the market open, a portfolio manager decides to buy Takuzi Ltd.'s shares and transfers a limit order for 1,000 shares at Sh.49.95 per share. The order expires unfilled. The share closes at Sh.50.05. On Friday, the order is revised to a limit of Sh.50.07. The order is partially filled that day as 700 shares are bought at Sh.50.07. The commission is Sh.23. The share closes at 50.09 and the order is cancelled.

**Required:**

The implementation shortfall in percentage. (4 marks)

- (c) (i) An analyst gathers the following data about asset allocation by a portfolio manager of ABC Capital:

Market	Actual weight in market	Benchmark weight in market	Market return (%)
Equity	0.70	0.70	5.81
Fixed income	0.07	0.25	1.45
Cash	0.23	0.05	0.48

**Required:**

The contribution of asset allocation to performance. (3 marks)

- (ii) Another analyst gathers the following data on a different allocation:

Market	Portfolio performance (%)	Index performance (%)	Portfolio weight
Equity	7.28	5.00	0.70
Fixed income	1.89	1.45	0.07

**Required:**

The contribution of selection to total performance. (2 marks)

- (d) A portfolio manager is analysing a University Endowment Fund with three years financial projections as shown in the table below:

Year	Market value of the portfolio	Additional capital injection (donations)
	Sh. "million"	Sh. "million"
2017	100	-
2018	130	40
2019	140	-

**Additional information:**

- The market value of the portfolio is quoted at the end of the financial year.
- The additional capital donations was at the beginning of the financial year.
- The Sh.40 million donation was from alumni association.

**Required:**

- (i) Money-weighted rate of return (MWRR). (3 marks)
- (ii) Time-weighted rate of return (TWRR). (3 marks)
- (iii) Advise on the most appropriate performance measure between the MWRR in (d) (i) above and TWRR in (d) (ii) above given that the donation is unrelated to the manager's market view. (2 marks)

**(Total: 20 marks)**

**QUESTION TWO**

- (a) William and his wife Kazoo recently inherited Sh.6,000,000 from their father and have approached Gerland Kisaka, a portfolio investment specialist for investment advice. Both William and Kazoo are 30 years old. William is employed in a steel manufacturing company earning a monthly salary of Sh.80,000 whereas Kazoo is a nurse earning a monthly salary of Sh.36,000. Their four children are aged 6, 5, 4 and 3 years. They currently have no other investments but have credit card with a debt of Sh.300,000.

During their interview with Gerland Kisaka, William made the following statements:

- I love being on top of the latest trends in investing.
- My friend Kahunyo told me that the really smart investors holds shares for no more than a month. After that if you haven't made a profit, you probably won't.
- Can you believe that my mother still have the same portfolio she had a year ago? How boring.
- Technology shares are hot, everyone is buying them.

**Required:**

- (i) Giving reasons, determine the couple's ability and willingness to take on risk. (3 marks)
- (ii) Determine the couple's time horizon constraints. (3 marks)
- (iii) Determine the couple's liquidity and legal/regulatory constraints. (2 marks)
- (b) Philip Ndavi's Sh.25 million investment portfolio is invested in domestic equities and Treasury bills in the proportion of 65% and 35% respectively. Philip decides to implement a constant mix rebalancing strategy by setting the multiplier equal to a value of 0.5. He also determines that domestic equities are expected to generate a return of 12% in the coming month.

**Required:**

Determine the value of equities to be sold to rebalance the portfolio should Ndavi's forecast concerning domestic equities materialise. (3 marks)

- (c) Grace Nyambura's investment portfolio is allocated to equities and bonds in the proportion of 30/70. She is exploring the potential for allocating a further Sh.3 million to the fund of funds (FOF) offered by a local hedge fund. She collects the monthly return on the hedge fund and its benchmark the Hedge Fund Composite Index for the previous year, 2019. She will use the data to forecast future fund performance. She plans to invest in the fund for a period of eight months.

**Monthly return for local hedge fund Fund of funds (2019)**

Month	Hedge Fund (%)
January	15.7
February	18.8
March	-5.7
April	12.7
May	2.7
June	9.8
July	15.0
August	-14.0
September	-2.0
October	14.3
November	18.7
December	22.1

Further, Grace evaluates whether the investment will improve the portfolio's annualised risk-adjusted performance. She compiles expected performance on the portfolio and hedge fund for the current year 2020.

**Current performance of portfolio and Hedge Fund Investment (2020)**

	Existing Portfolio*	FoF's Investment
Annualised return (%)	9.7	14.8
Annualised risk free rate (%)	2.2	2.2
Annualised standard deviation (%)	15.0	28.9
Correlation between portfolio's return and hedge fund investment return is – 0.5		

\* Performance before the inclusion of the FoFs investment

**Required:**

- (i) The value of Grace's investment at the end of her investment horizon using the eight month average rolling return. (6 marks)
- (ii) Justify whether Grace should allocate Sh.3 million to the FoF. (3 marks)

**(Total: 20 marks)**

**QUESTION THREE**

Ken's family charitable foundation (KFCF) plans to fund projects in perpetuity that will provide clean water in the country. The current portfolio is worth Sh.250 million and is invested equally in equities and fixed income. The portfolio's equity holding are in a fund tracking a broad index of stocks and the fixed income are in a fund tracking on all maturity index of government bonds. The portfolio of the foundation is rebalanced every six months. An analyst is hired to advise on KFCF's asset allocation and investments.

The foundation seeks to achieve the following objectives:

1. Spend at least 3% of the fund's beginning value on projects each year in order to satisfy a legal requirement.
2. As part of this annual distribution, spend at least Sh.5 million (inflation adjusted each year on projects in its county).
3. Minimise the likelihood of a decline in the portfolio's value of more than 10% in any single year.

The analyst recommends that KFCF establish an investment policy statement (IPS) and globally diversify its portfolio. The analyst discusses the asset only (AO) and asset liability management (ALM) approaches to setting KFCF's policy asset allocation.

To better diversify the policy asset allocation, the analyst specifically recommends that the foundation consider adding the following four asset classes:

- Non domestic developed equities.
- Emerging market equities.
- Broad domestic fixed income including government and credit.
- Alternative investments, including real estate, commodities and private equity.

The analyst evaluates whether adding an additional asset class to KFCF's portfolio will improve its risk-return characteristics.

**Additional information:**

1. The inflations rate is 0.5%.
2. The risk free rate is 1%.
3. The correlation between current portfolio and emerging market equities is 0.79.
4. Long-term capital market expectations:

	Return (%)	Standard deviation (%)
Current KFCF portfolio	4.5	6.5
Emerging market equities	7.5	13.5

5. The analyst also evaluates available methods for determining the target asset class weights in the IPS. The analyst decides to use a Monte Carlo simulation rather than a single period mean variance optimisation (MVO) to establish these target weights. The KFCF has an above average risk tolerance.

**Required:**

- (a) Discuss why each of the following approaches could be appropriate in setting KFCF's policy asset allocation:
- (i) Asset only (AO) approach. (3 marks)
  - (ii) Asset liability management (ALM) approach. (2 marks)
- (b) Giving three reasons, explain why the set of six asset classes (current portfolio plus the analyst's recommendation) for the KFCF policy asset allocation are not appropriately specified. (6 marks)
- (c) Determine, based on mean-variance analysis, whether emerging market equities should be added to the current KFCF portfolio. (5 marks)
- (d) Support with two reasons, the analyst's choice of Monte Carlo simulation rather than mean variance optimisation (MVO), to determine KFCF's target asset class weights. (4 marks)

**(Total: 20 marks)**

**QUESTION FOUR**

- (a) Elucidate three factors that should be considered while selecting a fixed-income manager in portfolio management. (6 marks)
- (b) Distinguish between "macro attribution" and "micro attribution" as used in evaluating portfolio performance. (4 marks)
- (c) Omogi Ltd. has presented the following data relating to its portfolio account and the benchmark portfolio for the year 2019:

	Omogi Ltd. account	Benchmark portfolio	Market index
Return (%)	2.0	2.1	2.5
Beta ( $\beta$ )	0.8	0.8	1.0
Standard deviation (%)	1.1	1.3	1.4
One year Treasury Bill rate (%)	0.2	0.2	0.2

**Required:**

Calculate the following performance measures for Omogi Ltd.'s portfolio and the benchmark portfolio:

- (i) Sharpe ratio. (2 marks)
  - (ii) Treynor's measure. (2 marks)
  - (iii) Explain the results obtained in (c) (i) and (c) (ii) above. (2 marks)
- (d) A manager has collected the following data on a bullet (no embedded options), a callable and puttable bond of the same issuer:

Bond	A	B	C
G-Spread (basis points)	425	423	426
I-Spread (basis points)	429	426	429
Z-Spread (basis points)	435	434	434
Option adjusted spread OAS (basis points)	351	503	434
Price	95.00	97.00	99.00
Accrued interest per 100 par	0.60	1.10	0.75

The bonds are similar in all other regards.

The manager purchases Sh.3 million and Sh.2 million par of bond A and bond C respectively.

**Required:**

Calculate the most relevant measure of portfolio spread.

(4 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

- (a) Highlight four sources of excess return for an international bond portfolio. (4 marks)
- (b) A fixed income consultant reviews the bonds held by an insurance company. He wants to rebalance the portfolio's money duration to Sh.240,000 while maintaining the existing security weights.

Security	Price (Sh.)	Market value in (Sh.)	Duration
Government bond	96.42	771,360	11.2
Company K corporate bond	95.00	855,000	9.4
Company L corporate bond	104.00	728,000	9.1
<b>Total</b>	-	<u>2,354,360</u>	-

**Required:**

- Calculate the amount (in shillings) of cash required to rebalance the portfolio's money duration. (6 marks)
- (c) With respect to currency portfolio management, explain four active currency trading strategies. (4 marks)
- (d) Davis Chirchir is currently based in the United States (US) and oversees the global equity fund offered by Triple A Ltd., a portfolio management firm. The fund holds global (Canadian, Mexican and British) and domestic US equities. Foreign currency exposures are currently unhedged.

The table below shows the value of the fund assets, spot exchange rates and correlations between movements in foreign currency asset returns and foreign currency returns:

**Fund asset values, spot rates and correlations**

	Year	
	2018	2019
CAD-denominated asset value (in CAD millions)	100	150
MXN-denominated asset value (in MXN millions)	80	70
GBP-denominated asset value (in GBP millions)	230	300
USD-denominated asset value (in USD millions)	500	450
CAD/USD spot rate	0.7900	0.8100
USD/MXN spot rate	15.2420	15.0050
GBP/USD spot rate	1.4754	1.5000

**Correlation between the currencies:**

- (RCAD, RCAD/USD) +0.7
- (RMXN, RMXN/USD) -0.3
- (RGBP, RGBP/USD) +0.2

Naomi has her portfolio held in the fund and her allocation to CAD, MXN, GBP and USD denominated equities is 30%, 40%, 25% and 5% respectively. Naomi is yet to establish the degree to which currency risk exposures should be hedged.

Where: CAD → Canadian Dollars  
 MXN → Mexican Peso  
 GBP → Great Britain Pound  
 USD → United States Dollar

**Required:**

- (i) Calculate the domestic currency return on Naomi portfolio. (3 marks)
- (ii) Describe three potential considerations which Naomi will need to account for when determining the degree of currency risk exposure to undertake.

Your answer should focus on the information provided above.

(3 marks)  
**(Total: 20 marks)**



CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT

WEDNESDAY: 27 November 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) Uchaguzi Foundation has endowed Uwazi Limited Fund for monitoring electoral integrity, supervise elections and political campaigns in a country implementing a new constitution and undergoing a political transition.

The Fund is headquartered in your country and it has received an initial grant of Sh.200 million with an additional Sh.400 million expected to be received over the next three years. The Fund's charter expressly decrees that the Fund should spend itself out of existence within 10 years of its founding rather than trying to become a permanent institution.

Required:

- (i) Recommend an appropriate risk objective and return objective for the Fund. (4 marks)
- (ii) Analyse five investment constraints for the Fund. (5 marks)
- (b) (i) With an aid of a well labelled diagram, explain the term "corner portfolio" as used in portfolio construction. (2 marks)
- (ii) Identify three characteristics of an efficient portfolio in the context of strategic asset allocation. (3 marks)
- (c) Samuel Kimanzi and his wife Ruth, both aged 54 years are Kenyan residents. The couple is planning to retire next year at age 55. They have approached Cabel Mutua, an investment advisor, to help them analyse their investment strategy and retirement choices.

Once the couple retires, Ruth will receive annual payments from her company's defined contribution (DC) pension plan and both of them will receive payments from the National Social Security Fund (NSSF). Samuel Kimanzi does not participate in any company or individual retirement plan.

The investment advisor has compiled financial data and market expectations for the couple's retirement as shown below:

Financial Data and Market Expectations		
Expected annual expenses		Sh.1,000,000
Annual pension income from Ruth's DC pension plan	Sh.320,000	
Combined NSSF receipts	<u>Sh.320,000</u>	
Total annual pension income	<u>Sh.640,000</u>	
Expected annual inflation	5.0%	

Currently, Cabel Mutua estimates that the couple's investment portfolio will grow to Sh.10 million by the retirement date next year. The investment advisor recommends that they plan to pay off their mortgage by withdrawing Sh.1.5 million from their portfolio upon retirement.

Required:

- Geometric nominal return to be included in the couple's investment policy statement (IPS). (6 marks)
- (Total: 20 marks)

**QUESTION TWO**

- (a) Explain the following terms as used in fixed income portfolio management:
- (i) Ladder portfolio. (1 mark)
  - (ii) Barbell portfolio. (1 mark)
  - (iii) Bullet portfolio. (1 mark)
  - (iv) Contingent immunisation. (1 mark)
- (b) Examine three conditions that must be satisfied to immunise a portfolio. (6 marks)
- (c) A client has asked you as his investment manager to match the absolute price sensitivity of its government bond portfolio to the absolute price sensitivity of its liability benchmark.

Due to the nature of the liabilities, the duration of the liability benchmark remains constant.

At the beginning of the current financial year, the bond portfolio absolute price sensitivity was equal to the absolute price sensitivity of the liability benchmark. At the end of the financial year, the manager is required to balance the portfolio so that the absolute price sensitivity of the assets again matches the absolute price sensitivity of the liability benchmark, while keeping the portfolio proportions of each bond unchanged.

The data required for rebalancing is provided below:

	Government bond portfolio			
	Beginning of Year		End of Year	
	Price	Duration	Price	Duration
Bond 1	94.50	4.9	94.00	4.3
Bond 2	90.00	7.0	93.00	6.3
Bond 3	103.50	5.5	102.00	5.0

Note: Each bond has a total par value of Sh.100,000  
Bond prices are shown as a percentage of par.

**Required:**

The amount of cash required for rebalancing the government bond portfolio. (7 marks)

- (d) Catherine Messo is a portfolio manager with Zedmac Investments Limited, a regional Fund managers. She is considering investments in alternative assets and decides to buy one August 5,000 bushel corn futures contract at Sh.250 per bushel.

The initial margin deposit is Sh.100,000 and the maintenance margin is Sh.75,000. At the end of the following day, the spot price of corn is Sh.245 and the price of August corn has fallen to Sh.240 per bushel.

**Required:**

The deposit required to bring the account back to the required level. (3 marks)  
**(Total: 20 marks)**

**QUESTION THREE**

- (a) Propose two approaches that could be used by a portfolio manager in constructing a passive equity portfolio. (4 marks)
- (b) Describe four limitations of the mean-variance optimisation (MVO) technique used in asset allocation. (4 marks)
- (c) Kabaka Musa has approached his investment adviser for help to determine an appropriate asset allocation. During conversations with Kabaka, the advisor finds that his risk-tolerance is average ( $\lambda = 4$ ) and that he would also like to minimise the chance of earning less than 3%.

The following asset allocations are available:

Allocation	Expected return (ER)	Variance ( $\sigma^2$ )
1	8%	0.0225
2	6%	0.0144
3	4%	0.0025

**Required:**

Advise Kabaka on the appropriate asset allocation.

(5 marks)

- (d) A client uses three long only portfolio managers for its equity investments. Details of those investments including expected performance relative to client's equity benchmark are provided below:

Clients equity portfolio managers	Investment size (Sh.millions)	Expected alpha	Expected tracking error
Manager D	100	0%	0%
Manager E	20	1.5%	2.5%
Manager F	10	2.0%	4.0%

**Required:**

- (i) Describe the approach used in constructing the portfolio for the client. (2 marks)
- (ii) The expected alpha for the portfolio. (2 marks)
- (iii) The expected tracking error for the portfolio. (3 marks)

(Total: 20 marks)

#### QUESTION FOUR

- (a) Evaluate five key determinants of the optimal corridor width of an asset class in a percentage of portfolio rebalancing program. (5 marks)
- (b) Assess four types of benchmarks which could be used in performance evaluation of a portfolio. (4 marks)
- (c) (i) Highlight three benefits of performance attribution analysis in portfolio management. (3 marks)
- (ii) The following information relates to John Meja, a portfolio manager responsible for managing Sh.100 million equity portfolios:

Sector	Portfolio's actual weight in sector at beginning of the period (%)	Benchmark weight in sector at beginning of the period (%)	Sector return (%)
Financials	35.00	30.00	6.50
Agriculture	20.00	30.00	3.20
Industrial	45.00	40.00	8.98

**Additional information:**

- The Portfolio manager invests at the local Securities Exchange and is currently using the equity index as the benchmark.
- The equity index return is 6.5%.

**Required:**

Sector selection attribute for the portfolio.

(5 marks)

- (d) A Euro-based investor has a 75% position in a Great Britain Pound (GBP) denominated assets and a 25% position in United States Dollar (USD) denominated assets. The results for the past one year are as follows:

Return for the GBP assets	12%
Return for the USD assets	5%
Beginning EUR/GBP exchange rate	1.1666
Ending EUR/GBP exchange rate	1.1437
Beginning USD/EUR exchange rate	1.332
Ending USD/EUR exchange rate	1.324

**Required:**

Calculate the investor's return over the period in domestic (EUR) currency terms.

(3 marks)

(Total: 20 marks)



**QUESTION FIVE**

- (a) Distinguish between “top down approach” and “bottom up approach” in relation to global credit bond portfolio management. (2 marks)
- (b) An investor has a Sh.10 million portfolio of bonds in a long position. Suppose the confidence interval is 95% and that the actual daily standard deviation of the portfolio over one trading year is 3.67%. The investor prefers to use risk metrics approach to calculate value at risk (VaR).

Note: Risk metrics uses 1.645 as the Z-score for 95% confidence level.

**Required:**

- (i) The value at risk (VaR) of the portfolio. (2 marks)
- (ii) The value at risk (VaR) for a 1-month horizon (30 days). (2 marks)
- (c) Nancy Nderitu, an investor at the Securities Exchange has realised that the bid-ask prices for Orion Group Limited’s shares are Sh.11.25 and Sh.11.30 respectively. A commission of Sh.2,500 is charged on purchase or sale of shares.

**Required:**

The transaction cost assuming that Nancy decides to purchase 10,000 shares and sell them immediately. (2 marks)

- (d) Frankline Wafula is considering to purchase 10,000 additional shares of Safariland Limited. He is not certain whether to use a market order or a limit order. The current limit order for the company’s shares at the Securities Exchange is provided below:

Price Sh.	Bid Size	Time	Price Sh.	Ask Size	Time
27.96	100	11 a.m.	28.10	500	11 a.m.
27.95	500	11 a.m.	28.12	300	11 a.m.
27.91	1,000	11 a.m.	28.13	1,500	11 a.m.
27.90	5,000	11 a.m.	28.16	3,000	11 a.m.
27.89	2,600	11 a.m.	28.18	5,000	11 a.m.
27.87	3,000	11 a.m.	28.25	4,500	11 a.m.
27.86	400	11 a.m.	28.27	4,700	11 a.m.

**Required:**

- (i) The average price per share assuming that Frankline entered a market order to purchase 10,000 shares of the company. (3 marks)
- (ii) The number of shares and average price per share assuming that Frankline entered a limit order of Sh.28.15. (3 marks)
- (e) Both direct and indirect investors in private equity need to understand the basics of direct private equity investment in order to have a grasp of its return and risk characteristics.

In light of the above statement, suggest three issues that must be addressed by a portfolio manager in formulating a strategy for private equity investments. (6 marks)

**(Total: 20 marks)**

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**CIFA PART III SECTION 6**

**ADVANCED PORTFOLIO MANAGEMENT**

**THURSDAY: 23 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) Explain the term "sector rotation" as used in portfolio asset allocation. (2 marks)
- (b) Explain the following terms as used in portfolio performance evaluation:
- (i) Performance attribution. (1 mark)
  - (ii) Allocation effect. (1 mark)
  - (iii) Selection effect. (1 mark)
  - (iv) Interaction effect. (1 mark)
- (c) Discuss three reasons why an indexed bond portfolio is more expensive than an indexed equity portfolio. (6 marks)
- (d) A portfolio manager of Zuhura Investments Group, manages a Sh.280 million investment portfolio. Zuhura's investment committee has recently become risk averse in anticipation of a major announcement regarding monetary policy to be issued by the Central Bank. To reflect this view, the portfolio manager, wishes to temporarily make the following changes in the portfolio:
1. Decrease the equity portfolio allocation and decrease its equity beta.
  2. Increase the bond portfolio allocation and decrease its modified duration.

The portfolio manager plans to use the following futures contract to achieve the over mentioned portfolio targets.

**Equity futures**

Currently priced at Sh.129,000 per contract (after accounting for the multiplier) with an equity beta of 0.97.

**Bond futures**

Currently priced at Sh.103,000 per contract, with a modified duration of 7.70 and a yield beta of 1.00.

The portfolio's current and target characteristics are as shown below:

**Investment portfolio characteristics**

**Current portfolio**

**Target portfolio**

Asset class	Modified duration	Equity beta	Allocation Sh."million"
Equities	-	1.08	182
Bonds	7.2	-	98

Asset class	Modified duration	Equity beta	Allocation Sh."million"
Equities	-	0.90	154
Bonds	6.0	-	126

**Required:**

Determine the action (buy or sell) and the number of futures contract required to achieve the following:

- (i) Equity targets. (4 marks)
- (ii) Bond targets. (4 marks)

**(Total: 20 marks)**

## QUESTION TWO

- (a) James Kivuva, a recent graduate of the Certified Investment and Financial Analyst examinations, has been employed at his county's social provident fund as an assistant portfolio manager responsible for monitoring the fund portfolio.

**Required:**

In light of the above statement, discuss three areas that James Kivuva should cover in his portfolio monitoring assignment. (6 marks)

- (b) Evaluate three risks that are associated with active investment management of equity portfolio. (6 marks)
- (c) A United States (U.S) portfolio manager holds a portfolio of Spain equities currently worth 10 million Euros (€). He is concerned that austerity measures being put in place by the newly elected government will lead to a potential depreciation of the Euro. The portfolio manager decides to hedge by selling September futures contract on the Euro that currently trade at \$1/€ and expire in two months.

The spot exchange rate is \$1/€. A month later, the value of the Spain portfolio is worth €10,050,000 and the spot exchange rate is \$1.05€ while the futures exchange rate is \$0.95/€.

**Required:**

The return on the hedged portfolio in dollar terms. (4 marks)

- (d) An investor has approached you for advice on where to invest his savings. He is considering to invest in a collective investment scheme (CIS). The following information relates to three mutual funds and their required rates of returns for the last three years:

Period	Annual returns (%)		
	Mutual fund		
Year	A	B	C
1	2	5	-8.3
2	9.5	8.2	7.5
3	-4.7	-6.4	7.6

**Required:**

- (i) The annualised rate of return of the three mutual funds for the period under review. (3 marks)

- (ii) Advise the investor based on your results in (d) (i) above. (1 mark)

**(Total: 20 marks)**

## QUESTION THREE

- (a) Kopa Fund generated a return of 11.2% over the past 12 months, while the benchmark portfolio return was 11.8% for the same period. The following information is provided:

Factor	Factor sensitivity (betas)		Factor Risk premium (A)
	Portfolio	Benchmark	
Price-earnings (P/E)	1.10	1.00	-5.00%
Size	0.69	1.02	2.00%

**Required:**

- (i) Attribute the cause of difference in returns using a fundamental factor model with the two factors provided above. (4 marks)
- (ii) Describe the manager's apparent skill in factor betas. (2 marks)
- (b) Discuss three phases of an individual's investment life cycle. (3 marks)
- (c) A portfolio is composed of domestic equity portfolio and international equity portfolio. The expected return for domestic equity portfolio is 11.8% and has a standard deviation of 20.3% while the expected return for international equity portfolio is 9.2% and has a standard deviation of 18.4%. The correlation between domestic equity portfolio and international equity portfolio is 0.66.

**Required:**

- (i) Determine the allocation for the global minimum-variance portfolio. (3 marks)
- (ii) The standard deviation of the combined portfolio. (3 marks)
- (iii) The expected return of the combined portfolio. (1 mark)

- (d) A portfolio statistics for the company's liabilities and three proposed portfolios; A, B and C are shown in the following table:

Statistics	Company liabilities	Proposed portfolios		
		A	B	C
Market value (Sh.)	457,780,900	460,000,000	460,000,000	460,000,000
Modified duration	7.52	7.51	7.53	7.37
Convexity	45.12	35.14	46.29	65.97
Basis point value (BPV)	344,250	343,100	345,400	339,120

**Additional information:**

1. All calculations are annualised and based on aggregate portfolio cash flows.
2. Each portfolio is considered sufficient to pay the liabilities.
3. The company also expects high volatility and potential for very large parallel shift in the yield curve.

**Required:**

- (i) Determine with reasons the most appropriate portfolio to immunise the liabilities. (2 marks)
  - (ii) Assuming that the company's expectations are correct, select with reasons the other portfolio most likely to be considered. (2 marks)
- (Total: 20 marks)**

**QUESTION FOUR**

- (a) Evan Walibora, aged 35 years, just retired from a successful career as a professional football player. He is meeting with his financial advisor to update his investment policy statement (IPS).

The following information is provided:

1. **Income**

Evan receives pension from the professional football association during retirement. This annual payment will total Sh.375,000 pre-tax in the coming year. In future years, this amount will be indexed for inflation, which is expected to be 1.25% per annum. The pension is taxed at the rate of 30%.

2. **Expenses**

Evan living expenses over the previous twelve months were Sh.400,000. He anticipates these expenses will grow at the expected rate of inflation this year and in each future year.

3. **Assets**

In addition to his pension payments, Evan has an advisor managed investment portfolio currently valued at Sh.5,200,000. Next week, he intends to make a direct equity real estate investment of Sh.450,000 in a sports training facility. The real estate holding will be excluded from his advisor managed investment portfolio. Further, in the coming days, he will receive a performance cash bonus of Sh.1,100,000 and it will be immediately invested in his portfolio. This bonus is subject to a tax at a rate of 30%.

4. **Goals**

Evan expects his portfolio to fund any expenses not covered by his pension, while maintaining its real value over time. He is eager to consider investments in more risky asset classes. He is not concerned about volatility in the value of his portfolio as long as it continues to support his living expenses. He does not intend to seek further employment in retirement.

The advisor concludes Evan's risk tolerance is above average. It is assumed that pension payments and ongoing expenses are end of year cash flows.

**Required:**

- (i) Determine Evan's nominal after tax required rate of return for the coming year. (6 marks)
  - (ii) Identify two factors that indicate Evan has a high ability to take risk. (2 marks)
  - (iii) Formulate the time horizon and unique circumstances constraints section of Evan's investment policy statement (IPS). (4 marks)
- (b) Hassan Ali, a junior financial analyst has been tasked by the portfolio manager to develop an investment strategy for private equity investment.

In light of the above statement, advise Hassan on three issues that must be addressed when formulating a strategy for private equity investment. (3 marks)

- (c) An endowment fund has an annual return objective of 9% which is sufficient to cover its spending rate, expected inflation and cost of earning investment returns. Its risk objective is to minimise risk as measured by standard deviation of returns while meeting its minimum expected return objective. The table below provides the output from a mean-variance optimisation with a budget constraint and a non-negative constraint:

	Expected return (%)	Standard deviation of returns (%)
Allocation AA	15	24
Allocation BB	18	27
Allocation CC	12	20
Allocation DD	10	14

The risk-free rate is 3%. The fund believes a true risk-free asset exists and could be used to construct a strategic asset allocation (SAA).

**Required:**

The risk of the optimal allocation.

(5 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

(a) In the context of portfolio execution decision, analyse four types of traders based on motivation to trade. (4 marks)

(b) An investor executed the following series of trade on 10 May 2019:

Number of shares	Market price per share (Sh.)
500	10.00
300	10.05
200	10.10

**Required:**

(i) The average price of the three trades. (1 mark)

(ii) The volume weighted average price (VWAP) of the trade. (2 marks)

(c) Explain three types of costs associated with portfolio rebalancing decision. (3 marks)

(d) The following information was obtained from the records of George Hesabu, a professional investment manager at Inubuka Investment Fund Manager (IIFM):

- Strategic portfolio allocations

Asset class	Target allocation (%)	Average returns (%)	Portfolio rebalancing costs as a % change in mix
			Sh. "000"
Kenyan Equities	30	15	500
Non Kenyan Equities	20	18	600
Kenyan Government Bonds	20	11	200
Non Kenyan Government Bonds	20	12.5	250
Commodities	10	10	100

- George Hesabu is considering rebalancing the asset mix of his portfolio and the following two cases have been proposed which are all within the rebalancing threshold as per the investment policy document:

Asset class	Rebalanced target (%)		Allocations (%)	
	Case A	Case B	Case A	Case B
Kenyan Equities	20	35	35	35
Non Kenyan Equities	25	30	30	30
Kenyan Government bonds	15	10	10	10
Non Kenyan Government bonds	25	15	15	15
Commodities	15	10	10	10

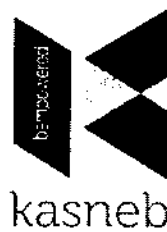
**Required:**

(i) Expected average return on the portfolio of the current asset allocation. (2 marks)

(ii) Expected average return on the portfolio after rebalancing for both Case A and Case B. (4 marks)

(iii) Assuming that the investor's objective is to minimise costs and maximise returns. Advise George Hesabu on the rebalancing option that he should consider. (4 marks)

**(Total: 20 marks)**



**CIFA PART III SECTION 6**

**ADVANCED PORTFOLIO MANAGEMENT**

**THURSDAY: 29 November 2018.**

**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) Evaluate three principles underlying tactical asset allocation. (6 marks)
- (b) AMN Ltd. is considering freezing its defined benefit plan (DB) and migrating to a defined contribution (DC) plan. The DC plan would be funded by a combination of company and employee contributions, with immediate vesting for all employees.

**Required:**

Assuming AMN Ltd. migrates from DB plan to DC plan:

- (i) Propose three advantages that would accrue to AMN Ltd. (3 marks)
- (ii) Explain three advantages that would accrue to the employees of AMN Ltd. (3 marks)
- (c) An analyst has gathered the following data about a portfolio for the month of September 2018:

	Sh.
	Sh. "000"
Fair value, 31 August 2018	16,575
Cash contribution, 12 September 2018	2,265
Fair value, 12 September 2018*	19,550
Fair value, 30 September 2018	19,250

**Note:** \* Includes cash contribution of Sh.2,265,000 received and available for investment on 12 September 2018.

**Required:**

- (i) The approximate time weighted rate of return for the month of September 2018 using the modified Dietz formula. (3 marks)
- (ii) The true time weighted rate of return for the month of September 2018. (3 marks)
- (d) Latena Ltd. manages a broadly diversified portfolio of global investment grade and high yield corporate bonds for its client. Latena Ltd.'s fixed income research team consists of a portfolio manager and three credit analysts who review and manage the portfolio. The portfolio manager uses a top-down approach while the credit analysts use a bottom-up methodology.

**Required:**

Contrast the approach used by the portfolio manager and the approach used by the credit analysts. (2 marks)  
**(Total: 20 marks)**

**QUESTION TWO**

- (a) Assess four factors that could explain the sources of abnormal return in the performance evaluation of international portfolio managers. (4 marks)
- (b) Benson Mogaka is a member of the investment committee of a local foundation with Sh.950 million in assets that supports medical research relating to malaria.

For the annual asset allocation review, Mogaka has prepared the following set of capital market expectations:

Asset class	Expected return (%)	Standard deviation (%)	Correlation			
			1	2	3	4
Domestic equities	8.6	20	1.00			
Non domestic equities	6.7	15	0.65	1.00		
Domestic bonds	4.1	10	0.34	0.25	1.00	
Real estate	5.0	12	0.50	0.35	0.17	1.00

Based on these capital market expectations, Mogaka has developed the following analysis:

**Corner portfolios**

Portfolio	Expected return (%)	Standard deviation (%)	Sharpe ratio	Asset class (Portfolio weight)			
				1 (%)	2 (%)	3 (%)	4 (%)
1	8.60	20.00	0.330	100.00	0.00	0.0	0.0
2	7.91	16.78	0.352	63.53	36.47	0.0	0.0
3	7.55	15.48	0.358	53.22	37.23	0.0	9.55
4	5.03	8.42	0.360	0.00	24.70	43.30	32.00
5	4.69	8.15	0.329	0.00	10.90	55.56	33.54

**Additional information:**

- The local foundation's spending rate is 3.5%.
- The expected long term inflation rate is 2.25%.
- The cost of earnings investment returns has averaged 43.6 basis points annually.
- The risk-free rate is 2.0%.

**Required:**

- Describe how corner portfolios arise. (2 marks)
- Compute the local foundation's return requirement. (2 marks)
- Recommend the strategic asset allocation that Mogaka should present for approval at the asset allocation review meeting. (6 marks)

(c) A summary of a portfolio manager's performance when compared to a benchmark is provided below:

Country	Benchmark weight	Return on equity index (%)	Currency appreciation (%)	Manager's weight	Manager's return (%)
A	0.30	10	10	0.35	8
B	0.10	5	-10	0.10	7
C	0.60	15	30	0.55	18

**Required:**

Determine the contribution of the following selections to overall performance:

- Currency selection. (2 marks)
  - Country selection. (2 marks)
  - Stock selection. (2 marks)
- (Total: 20 marks)**

**QUESTION THREE**

- Analyse four changes in investors circumstances that could necessitate the need for portfolio revision by the fund manager. (4 marks)
- An investor is holding a portfolio in the following classes of assets: Equities, Bonds, Cash, Property and Commodities. Upon reading his investment policy document you find the following information:

Asset	Allocation policy (%)	
	Minimum	Maximum
Equities	20	40
Bonds	10	30
Cash	10	20
Property	5	25
Commodities	5	25

The average yield on the asset investments is also provided below:

Asset	Average yield (%)
Equities	15
Bonds	8
Cash	5
Property	20
Commodities	10

Currently, the investor has allocated his capital in the following proportions: 35% in Equities, 25% in Bonds, 10% in cash, 25% in property and 5% in commodities. The investor is however not sure whether this allocation provides the optimal return on his portfolio and has sought your advice on whether or not he should consider revising his allocation. He has provided you with the following suggested asset allocation from different investment analysts:

Investment Analyst	Asset Allocation Advice (%)				
	Equities	Bonds	Cash	Property	Commodities
A	40	10	15	25	10
B	38	20	12	20	10
C	30	25	10	25	10

**Required:**

- (i) Expected return on the portfolio based on the current investment policy. (3 marks)
- (ii) Evaluate the three pieces of investment advice provided to the investor and advise him whether to change the current asset allocation. (6 marks)
- (c) The following performance attribution analysis is provided for three portfolio managers:

	Manager A		Manager B		Manager C	
	(%)		(%)		(%)	
Actual return	19.1		17.0		12.6	
Benchmark portfolio	14.9		15.2		12.6	
Active management return	?	(99)	(?)	(53)	?	(3)
<b>Component of returns:</b>						
Market timing	-0.2	(40)	-0.6	(64)	-0.5	(73)
Industry exposure	0.2	(20)	-2.0	(89)	0.3	(34)
Sector emphasis	2.2	(99)	3.9	(99)	0.3	(51)
Security selection	1.9	(84)	0.6	(43)	0.1	(7)
Unreconciled return	0.1		-0.1		-0.2	

Note: The values in bracket denotes the confidence level.

**Required:**

- (i) Calculate the active management returns for each portfolio manager. (3 marks)
- (ii) Comment on the performance of each of the portfolio managers. (3 marks)
- (iii) With specific reference to Manager A, is the performance attributable to skill or luck? Explain. (1 mark)
- (Total: 20 marks)**

#### QUESTION FOUR

- (a) Describe three criteria that could be used by an investor while selecting a fixed income manager. (3 marks)
- (b) Examine three active currency management strategies in the context of currency portfolio management. (6 marks)
- (c) An investment manager manages a Sh.500 million corporate bond portfolio with a weighted average duration of 5 years. Over the course of the year, the investment manager turns over the portfolio 80% and pays an average bid-ask spread of 3 basis points.

**Required:**

Calculate the portfolio trading costs. (2 marks)



(d) The following information is provided about three portfolios and the market portfolio:

Portfolio	Expected return (%)	Standard deviation (%)	Beta factor
A	13	13	0.90
B	17	22	1.05
C	16	23	1.20
Market	14	20	-

The risk-free rate is 8%.

**Required:**

Evaluate the performance of the above portfolios using the following performance measures:

- (i) Jensen's measure. (3 marks)
  - (ii) Treynor's measure. (2 marks)
  - (iii) Sharpe's ratio. (2 marks)
  - (iv) Information ratio. (2 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) Examine two approaches that a portfolio manager could employ to hedge currency risk in an international bond investment. (4 marks)
- (b) A hedge fund consultant is approached by a hedge fund which is concerned with developing techniques to reduce negative skewness in a hedge fund investment return.

**Required:**

Analyse two techniques that could be used to reduce negative skewness in a hedge fund investment return. (4 marks)

- (c) Outline three important characteristics of bond immunisation. (3 marks)
- (d) A fund manager responsible for overseeing a Sh. 2 billion portfolio of government bonds expects the portfolio will earn a return of 8% over the next year. However, his client requires a one-year return of 10%. The manager believes he can enhance returns by leveraging the portfolio. He plans to borrow at an interest rate of 5% per annum and invest the proceeds in government bonds identical to those held in the portfolio. The duration of the bond portfolio is 10 and the duration of the borrowed funds is 1.

**Required:**

- (i) The amount the manager needs to borrow to increase the one year return from 8% to 10%. (3 marks)
- (ii) The duration of the leveraged portfolio. (3 marks)

- (e) Hillary Langat, a stockbroker at Faida Stock brokerage services has the following quotation in his order management system:

Stock ticker	Trade size	Average Daily volume	Price (Sh.)	Speed (%)	Urgency
A	20,000	250,000	24.67	0.06	Low
B	50,000	125,000	12.18	0.45	Low
C	150,000	2,500,000	37.88	0.05	High

**Required:**

Discuss the appropriate trading strategy that should be used to place each order.

(3 marks)

**(Total: 20 marks)**

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**CIFA PART III SECTION 6**

**ADVANCED PORTFOLIO MANAGEMENT**

**THURSDAY: 24 May 2018.**

**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) Argue four cases against the use of volume-weighted average price (VWAP) when evaluating trade executions. (4 marks)
- (b) The following information relates to trade executions of MIC Ltd. shares at Mesdaq Stock Exchange (MSE):
1. On Wednesday, 9 May 2018, MIC Ltd.'s shares closed at a market price per share (MPS) of Sh.50.00.
  2. On Thursday, 10 May 2018 before the market opens, a trader places a limit order for 1,000 MIC Ltd. shares at Sh.49.95. The order expires unfilled. The company's shares close at a MPS of Sh.50.05.
  3. On Friday, 11 May 2018, the order is revised to a limit of Sh.50.07. The order is partially filled that day as 700 shares are bought at Sh.50.07. The commission is Sh.23.00. The company shares close at Sh.50.09 and the order is cancelled.

**Required:**

The total implementation shortfall (IS). (8 marks)

- (c) The board of trustees of the Western Koru Ltd. pension plan is considering adding direct real estate investments to its diversified, Sh.500 million pension fund portfolio. This would be accomplished by acquiring commercial office buildings, shopping centres, industrial warehouses and residential properties. A consultant advised the board as follows:

"Our mean-variance computer model uses statistical data to optimise all asset classes. Based on that model, I recommend an optimal portfolio for Western Koru Ltd. consisting of 40% allocation of the portfolio to direct real estate investments given the risk and return objectives set by the board for the fund".

**Required:**

Evaluate the consultant's statement by addressing the return and risk characteristics of the data and the resulting recommendation of the consultant. (4 marks)

- (d) Mark Mutisya is an analyst for a fund sponsor in his country. The fund sponsor uses two equity managers (Manager A and Manager B) and each manager invests in developed and emerging markets. He prepares a performance attribution analysis for the total fund. He identifies the fund's sources of return and develops the macro attribution table below:

**Total fund level  
Macroattribution for 1 January - 31 March 2018**

Decision making level (investment alternative)	Fund value Sh. "000"	Incremental return Contribution (%)	Incremental value contribution/withdrawal Sh. "000"
Beginning value	360,000	-	-
Risk-free asset	361,800	0.50	1,800
Asset category	388,872	7.52	27,072
Benchmarks	389,376	0.14	504
Investment managers	389,664	0.08	288
Allocation effects	389,304	-0.10	(360)
Total fund	389,304	8.14	29,304

**Required:**

- (i) Determine whether the total fund outperformed the pure indexing strategy. (2 marks)
- (ii) Determine how much of the fund's return was due to style bias and active management. (2 marks)

**(Total: 20 marks)**

**QUESTION TWO**

(a) Jackson Maina is a portfolio manager managing a Sh.200 million portfolio for a client. His proprietary research has led him to believe that the share price of Athi Ltd. will increase substantially. Athi Ltd. is currently trading at Sh.9.75 per share. He wants to purchase 1,000,000 shares of Athi Ltd. for the client's portfolio as quickly as possible with minimal effect on the share price. Average daily trading volume in Athi Ltd. over the previous 10 days was 1,500,000 shares. Jackson decides to use "advertise-to-draw-liquidity" techniques for this trade execution.

Jackson also buys 3,000 shares of TwoStream Homes (TSH) Ltd. for the client's portfolio. TSH Ltd. trades on a quote driven dealer market and has an average daily trading volume of 25,000,000 shares. His order is executed in two trades as shown below. He analyses the trading costs of the entire transaction.

	TSH Ltd. trade data					
	Bid price (Sh.)	Bid quantity (shares)	Ask price (Sh.)	Ask quantity (shares)	Trade price (Sh.)	Trade quantity (shares)
First trade	21.07	3000	21.13	2500	21.13	2000
Second trade	21.05	3000	21.11	2500	21.09	1000

Six months later, Jackson discusses three potential rebalancing strategies with his client: buy and hold, constant mix and constant-proportion portfolio insurance (CPPI). To manage risk, Jackson rebalances the client's portfolio by adjusting the allocation between equities and money market instruments. The client is willing to invest a greater proportion of his wealth in risky assets as his portfolio value increases. Jackson believes the recent bull market has ended and the market will be flat but oscillating. His objective is to choose the rebalancing strategy with the highest expected return that is also consistent with the client's risk tolerance.

**Required:**

- (i) Explain two disadvantages of Jackson's proposed technique for the Athi Ltd. trade execution. (2 marks)
- (ii) Calculate the share-volume-weighted effective spread for the TSH Ltd. transaction. (3 marks)
- (iii) Determine, given Jackson's objective, the most appropriate rebalancing strategy. (1 mark)
- (iv) Explain why the two strategies not selected are less appropriate. (2 marks)

(b) Annitta Mwilu is an investment advisor for institutional clients. She advises the Welcare Endowment Fund (WEF) and is tasked to recommend an optimal asset allocation. The objective of the WEF is to achieve a nominal return of 8.0% per annum with the lowest possible level of risk. The WEF board of directors' risk management policies include a maximum standard deviation of 14.0% and prohibit the use of leverage. The table below provides the results of a mean-variance optimisation (MVO) based on an annual inflation rate of 1.5% and a risk-free rate of 0.5%.

**WEF corner portfolios**

Corner portfolio	Expected return (%)	Expected standard deviation (%)	Expected Sharpe ratio	Domestic equity	Asset class weights (%)		
					International equity	Corporate bonds	Government bonds
1	9.00	18.0	0.47	100	0	0	0
2	8.90	16.2	0.52	90	10	0	0
3	8.60	13.8	0.59	75	20	5	0
4	7.65	11.2	0.64	60	15	15	10
5	7.00	10.5	0.62	50	10	25	15

Annitta advises the board to allow the use of leverage. She proposes a strategic asset allocation that combines the corner portfolio closest to the tangency portfolio in the above table with a risk-free borrowing rate. WEF's annual nominal return objective remains at 8.0%.

**Required:**

- (i) Recommend two corner portfolios that Annitta Mwilu should use for the optimal asset allocation to achieve WEF's fund return requirement. (2 marks)
- (ii) Determine the weights for each of the two corner portfolios recommended in (b) (i) above. (3 marks)
- (iii) Calculate the optimal level of leverage necessary to achieve WEF's return objective. (4 marks)
- (iv) Determine whether the unleveraged or leveraged strategic asset allocation offers lower expected volatility to achieve WEF's return objective. (3 marks)

(Total: 20 marks)

### QUESTION THREE

- (a) Outline two advantages and two disadvantages of using each of the following benchmarks when evaluating portfolio performance:
- (i) Custom security-based benchmarks. (4 marks)
- (ii) Factor-model-based benchmarks. (4 marks)
- (b) Sospeter Onyango, a portfolio manager with Stanbix Asset Managers (SAM) was provided with the data in the table below to appraise the performance of four asset management firms:

	Performance appraisal data				
	Fund W	Fund X	Fund Y	Fund Z	Market index
Return (%)	6.45	8.96	9.44	5.82	7.60
Standard deviation (%)	2.74	4.54	3.72	2.64	2.80
Beta	0.88	1.02	1.36	0.80	1.00

The risk-free rate of return for the relevant period was 3%.

#### Required:

Compute the following risk-adjusted performance measures for the four funds:

- (i) Jensen's alpha measure. (3 marks)
- (ii) Treynor's measure. (3 marks)
- (iii) Sharpe ratio. (3 marks)
- (iv) M<sup>2</sup> measure. (3 marks)

(Total: 20 marks)

### QUESTION FOUR

- (a) Identify four challenges that you are likely to face when managing emerging markets' currency exposures. (4 marks)
- (b) Argue four cases against the use of mean-variance optimisation (MVO) approach to asset allocation. (4 marks)
- (c) A global investor has invested Sh.100,000 in a global equity portfolio made up of United States (US), Asian and European stocks. On 31 December 2017, the portfolio consists of 500 shares of IBM listed in New York, 200 Sony Corporation shares listed in Tokyo, Japan and 50 shares of BMW listed in Frankfurt, Germany. He intends to beat the world index used as a benchmark. This index has a 50% weight in the US stock index, a 25% weight in the Japanese stock index and a 25% weight in the European stock index. The country components of the portfolio have an average risk relative to their respective country indices. He uses the United States dollar (USD) as the base currency. On 31 March 2018, his portfolio had gained 4.065%, while the world index gained only 0.735% in USD. He wishes to understand why his portfolio had such a good performance over the quarter. All the necessary data is provided below. There were no cash flows in the portfolio and there were no dividends paid.

Global equity portfolio: Composition and market data							
Portfolio	Number of shares	Price in local currency		Portfolio value on 31 December 2017		Portfolio value on 31 March 2018	
		31 December 2017	31 March 2018	Local currency	USD	Local currency	USD
US stocks: IBM	500	100	105	50,000	50,000	52,500	52,500
Japanese stocks: Sony Corp.	200	10,000	11,000	2,000,000	20,000	2,200,000	20,952
European stocks: BMW	50	600	600	30,000	30,000	30,000	30,612
<b>Total</b>					<b>100,000</b>		<b>104,065</b>

#### Market data

	31 December 2017	31 March 2018
World index in USD	100	100.735
US Index in USD	100	103
Japanese index in Yen	100	105
European index in Euro	100	95
Yen/USD	100	105
Euro/USD	1	0.98

**Required:**

- (i) Decompose the total return on the portfolio paid into capital gains (in local currency) and currency contribution. (4 marks)
  - (ii) Determine the contribution of security selection. (4 marks)
  - (iii) Attribute the performance relative to the benchmark (world index) to the various investment decisions. (4 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) Explain four international bond portfolio management styles. (4 marks)
- (b) Global credit portfolio management presents a complex challenge. Each day, hundreds of credit portfolio managers face thousands of choices in the primary (new issue) and secondary markets. In addition to tracking primary and secondary flows, investors have to keep tabs on ever-varying issuer fundamentals, creditworthiness, acquisitions, earnings and credit ratings among others. The task of global credit portfolio management is to process all of this rapidly changing information about the credit markets (issuers, issues, dealers and competing managers) and to construct the portfolio with the best return for a given risk tolerance.

**Required:**

In relation to the above statement, discuss five methodologies for credit relative-value maximisation. (5 marks)

- (c) The board of directors of Kenbrite Financial Services (KFS) are considering hiring a consultant to advise on fixed income portfolio management. They invite candidates for a presentation on the topic "bond portfolio immunisation".

The following are some of the statements that were made during the presentation:

1. A great thing about immunisation is that it is a set-and-forget strategy. That is, once you have immunised your portfolio, there is no subsequent work to be done.
2. The immunisation target rate of return is less than yield-to-maturity.
3. If a portfolio is immunised against a change in the market yield at a given horizon by matching portfolio duration to horizon, the portfolio faces no risk except for default risk.
4. The liquidity of securities used to construct an immunised portfolio is irrelevant.
5. In general, the entire portfolio does not have to be turned over to rebalance an immunised portfolio. Furthermore, rebalancing needs to be done on a daily basis.

**Required:**

Critique each of the above statements. (5 marks)

- (d) Anthony Kipnetich, a trader in the options market, was provided with the following information:

Market price per share (MPS)	Sh.46.00
Exercise price of a call option	Sh.45.00
Call premium	Sh.5.00
The delta value	0.5420
Number of call options sold	1000
Value of delta at the end of the previous day	0.6400
Continuously compounded risk-free rate	4.5%

**Required:**

- (i) The number of shares needed to delta-hedge the call position at the end of the previous day. (1 mark)
  - (ii) The market value of the portfolio today given that at the end of the previous day, there was a loan balance of Sh.3,000. (2 marks)
  - (iii) Assuming that the market price per share is Sh.45.50 and the call premium is Sh.4.71 the following day, calculate the market value of the delta-hedged portfolio and compare it with a benchmark based on the market value of the delta-hedged portfolio calculated in (d) (ii) above. (3 marks)
- (Total: 20 marks)**
- .....



**CIFA PART III SECTION 6**

**ADVANCED PORTFOLIO MANAGEMENT**

**THURSDAY: 30 November 2017.**

**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) In the context of asset allocation, explain the following terms:

- (i) Strategic asset allocation. (1 mark)
- (ii) Tactical asset allocation. (1 mark)
- (iii) Asset/liability management (ALM) approach. (1 mark)
- (iv) Asset only (AO) approach. (1 mark)
- (v) Mean-variance approach. (1 mark)

(b) Apco Capital, an investment management firm has a client intending to temporarily reduce his exposure to equities by converting a Sh.25 million equity position to cash for a period of four months. The client would like this reduction to take place without liquidating his equity position. Apco Capital plans to create a synthetic cash position using an equity futures contract. The futures contract is priced at Sh.1,170.10, has a multiplier of Sh.250, and expires in four months. The dividend yield on the underlying index is 1.25% and the risk-free rate is 2.75%.

**Required:**

- (i) The number of futures contracts required to create a synthetic cash. (2 marks)
- (ii) The effective amount of money committed to this risk-free transaction and the effective number of units of the equity index that are converted to cash. (3 marks)
- (iii) Assume that the equity index is at 1031 when the futures contract expires. Illustrate how this strategy is equivalent to investing the risk-free asset, cash. (3 marks)

(c) Kennedy Imanyara, a portfolio manager, believes that the market will be volatile in the near future, but he does not feel particularly strongly about the direction of the movement. With this expectation, he decides to buy both a call and a put with the same exercise price and the same expiration on the same underlying stock trading at Sh.28. He buys one call option and one put option on this stock, both with an exercise price of Sh.25. The premium on the call is Sh.4 and the premium on the put is Sh.1.

**Required:**

- (i) Identify the term commonly used to refer to the position taken by Kennedy Imanyara. (1 mark)
- (ii) Determine the value at expiration and the profit for Imanyara's strategy when the price of the stock at expiration is Sh.35, Sh.29 and Sh.25 respectively. (6 marks)

**(Total: 20 marks)**

**QUESTION TWO**

(a) In relation to portfolio performance evaluation:

- (i) Compare and contrast the terms "macro attribution" and "micro attribution". (2 marks)
- (ii) Discuss three inputs that could be used under micro attribution approach. (3 marks)

- (b) In practice, an acceptable benchmark is one that both the investment manager and the plan sponsor agree represents the manager's investment process. However, in order to function effectively in performance evaluation, a benchmark should possess certain basic properties.

**Required:**

In relation to the above statement, highlight five properties of a valid benchmark. (3 mark)

- (c) Simon Ageyo, an international bond portfolio manager is considering two bonds for investment. The two bonds are comparable in terms of risk characteristics. The following information relates to the two bonds:

Country	Nominal return (%)	Risk-free rate (%)	Exchange rate per domestic currency
A	9.75	8.5	3.0
B	4.75	3.25	5.0
Domestic	Not applicable	5.75	Not applicable

**Additional information:**

- Country A's currency is expected to depreciate against the domestic country's currency by 2.6%.
- Country B's currency is expected to appreciate against the domestic country's currency by 2.6%.

**Required:**

- (i) Determine the bond that Simon Ageyo should select on a fully hedged basis. Justify your answer. (3 marks)
- (ii) Assuming that Simon Ageyo selects the bond identified in (c) (i) above, explain whether the bond's currency exposure should be hedged. (3 marks)
- (d) David Mwanzia is evaluating an active manager, C Limited. The selected information for other active managers as well as their normal benchmark returns and investor benchmark returns are presented below:

**Active portfolio managers' characteristics and benchmark information**

Portfolio manager	Manager's return (%)	Normal benchmark return (%)	Investor benchmark return (%)	Total active risk (%)	Misfit active risk (%)
A	15.00	11.25	8.50	6.05	4.40
B	13.20	14.25	7.50	4.68	3.40
C	12.75	15.00	10.00	5.50	4.00

PM Ltd. follows a passive investment strategy that is implemented using exchange-traded funds.

David Mwanzia proposes to construct a core satellite portfolio with the following allocations: 45% in PM Ltd., 15% in A Ltd., 20% in B Ltd. and 20% in C Ltd. Mwanzia assumes that the manager's active returns are uncorrelated. Mwanzia assumes that active return and active risk for PM Ltd. are 0%.

**Required:**

- (i) The portfolio's total active return. (2 marks)
- (ii) The portfolio's total active risk. (2 marks)

**(Total: 20 marks)**

**QUESTION THREE**

- (a) In the context of execution of portfolio decisions:

- (i) Explain the term "implementation shortfall". (1 mark)
- (ii) Outline four advantages of implementation shortfall. (4 marks)

- (b) The following sell orders were placed for a stock on Tuesday, 21 November 2017:

Trade quotes during the trading hours of 21 November 2017				
Time	Bid price (Sh.)	Bid size	Ask price (Sh.)	Ask size
10.00 am	121.00	300	121.60	400
1.00 pm	120.00	300	120.70	400
2.00 pm	118.00	300	118.80	400

**Additional information:**

1. At 10.00 am, the trader placed an order to sell 100 shares. The execution price was Sh.121.10.
2. At 1.00 pm, the trader placed an order to sell 300 shares. The execution price was Sh.120.00.
3. At 2.00 pm, the trader placed an order to sell 600 shares. The average execution price was Sh.117.50.

**Required:**

- (i) Average quoted spread. (2 marks)
  - (ii) Average effective spread. (3 marks)
  - (iii) Weighted average effective spread. (2 marks)
- (c) The board of Trustees of Mambo Ltd.'s Sh.50 million pension fund are meeting to discuss a presentation they recently received from their pension consultant. The consultant has recommended that they diversify their current 50/50 equity/bond asset allocation to include a 10% allocation to real asset. Although the trustees would like to reduce portfolio risks without sacrificing a significant amount of return, the trustees have previously been reluctant to change asset allocation since they are concerned about "making a mistake we can't easily fix" if the economic environment changes.

One trustee, Samson Wako, makes reference to Table 1 below and some notes that provide an overview of how the various indices are constructed. Wako states: "To address our stated risk and return objectives and given the superior historical benefits of direct investing in real estate, represented by the unsmoothed NCREIF index, I recommend that we reallocate 10% from our bond investments indexed to the Lehman aggregate to a direct real estate asset".

A second trustee, Samuel Mogaka, responds with a different recommendation: "I believe we should reallocate 10% from the 50% S & P 500 allocation to REITs to achieve our goals".

**Table 1 : Real estate performance**

Measure	NAREIT Index	NAREIT Index hedged	NCREIF Index	NCREIF Index unsmoothed	S & P 500	Lehman Aggregate Bond index
Annualised return	12.71%	8.96%	6.14%	7.27%	10.94%	7.70%
Annualised standard deviation	12.74%	11.93%	3.37%	8.95%	14.65%	3.91%
Sharpe ratio	0.66	0.39	0.55	0.33	0.45	0.87
Minimum quarterly return	-14.19%	-10.16%	-5.33%	-18.55%	-17.28%	-2.87%
Correlation with NAREIT	1.00	0.94	-0.001	0.21	0.35	0.18
Correlation with NAREIT hedged	0.94	1.00	0.00	0.24	0.00	0.14
Correlation with NCREIF	0.00	0.00	1.00	0.71	0.01	-0.18
Correlation with NCREIF unsmoothed	0.21	0.24	0.71	1.00	-0.01	-0.27

**Required:**

- (i) Critique Samson Wako's recommendation with reference to the return, risk, diversification and liquidity characteristics of the two asset classes that Wako is referring to. (4 marks)
- (ii) Critique Samuel Mogaka's recommendation with reference to the return, risk, diversification and liquidity characteristics of the two asset classes that Mogaka is referring to. (4 marks)

**(Total: 20 marks)****QUESTION FOUR**

- (a) Discuss five factors that a portfolio manager should consider while establishing the band for an asset class under a percentage-of-portfolio rebalancing program. (5 marks)
- (b) Describe three strategic portfolio implications of the bullet structure with an intermediate maturity. (3 marks)
- (c) With reference to credit relative-value analysis, examine the following basic approaches used in global credit bond portfolio management:
  - (i) Top-down approach. (2 marks)
  - (ii) Bottom-up approach. (2 marks)
  - (iii) Classic relative-value analysis. (2 marks)



- (d) Stephen Tarus is a portfolio manager at a global firm investing in emerging markets. He has collected the following data regarding equity portfolio and currency data:

**Mexican equity portfolio and currency data**

	Now	In one month
Portfolio value in Mexican Pesos (MXN)	20,000,000	21,000,000
British Pound-Mexican Peso spot rate (GBP/MXN)	0.0494	0.0490
British Pound-Mexican Peso futures rate (GBP/MXN)	0.0491	0.0486
British one-year interest rate	5.35%	
Mexican one-year interest rate	7.50%	

**Note:** The futures contract has three months to expiration.

**Required:**

- (i) The one-month British Pound return on the unhedged portfolio. (3 marks)
- (ii) The one-month British Pound return on the hedged portfolio. (3 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

- (a) Evaluate two advantages of each of the following bond portfolio management strategies:

- (i) Pure bond indexing (PBI) strategy. (2 marks)
- (ii) Enhanced indexing by matching primary risk factors. (2 marks)
- (iii) Enhanced indexing by small risk factor mismatches. (2 marks)
- (iv) Active management by larger risk factor mismatches. (2 marks)
- (v) Full-blown active management. (2 marks)

- (b) Phillip Kyalo is evaluating several alternatives for the United States (US) equity portfolio of his company's pension plan, involving the following managers:

Manager	Active return (%)	Active risk (with respect to normal benchmark) (%)	Normal benchmark
Index	0	0	Russell 3000
Semiactive	1	1.5	Russell 3000
Active manager A (Value)	3	5	Russell 1000 Value
Active manager B (Growth)	4	6	Russell 1000 Growth
Long-short	6	6	Cash with Russell 1000 overlay

Active manager A's misfit risk is 7.13%. The overall equity portfolio benchmark is Russell 3000.

Assume that the active returns are uncorrelated.

**Required:**

- (i) Kyalo has taken the information in the table above and used a mean-variance optimiser to create an implementation efficient frontier. The highest risk point on the efficient frontier is a 100% allocation to the long-short manager with a 100% Russell 1000 overlay. The active risk of this portfolio is 6.1%.  
Explain why the risk is greater than 6%. (2 marks)
- (ii) Calculate the total active risk for Active manager A. (1 mark)
- (iii) Kyalo's current equity manager allocation is 30% index and 70% semiactive.  
Calculate this portfolio's current expected active return, active risk, and information ratio. (3 marks)

- (iv) After determining the desired level of active risk, Kyalo selected the appropriate portfolio from the efficient frontier. The portfolio allocates 39% to the index manager, 34% to the semiactive manager, 7% to active manager A, 8% to active manager B, and 12% to the long-short manager. This portfolio has an expected active return of 1.59% and an expected active risk of 1.10%.

Explain whether this portfolio represents an improvement over the current allocation, and if so, by how much. (2 marks)

- (v) Upon further investigation of long-short manager, Kyalo learns that approximately 20% of the active return generated comes from equity positions in non-US companies.

Giving reasons, explain whether this is a concern. (2 marks)  
**(Total: 20 marks)**

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# KASNEB

## CIFA PART III SECTION 6

### ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 25 May 2017.

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) In relation to options trading, describe the following risk management strategies:

- (i) Bull spread. (1 mark)
- (ii) Bear spread. (1 mark)
- (iii) Butterfly spread. (1 mark)

(b) Kefa Omanga is a portfolio manager for Hisa domestic equity portfolio. Kefa intends to compare the return performance of the following portfolio rebalancing strategies:

1. A constant-mix strategy allocated 90% to domestic equities and 10% to risk-free securities.
2. A constant-proportion portfolio insurance (CPPI) strategy with a floor value of 10% of the current market value of the domestic equity portfolio.

Hisa's forecast for the domestic equity market is for flat returns in the long term with periods of significant market volatility.

**Required:**

Compare the expected performance of the constant-mix and CPPI strategies assuming Hisa's forecast proves correct. (4 marks)

(c) Cecilia Ogalo and Alberto Magala are discussing how to evaluate a hedge fund manager. Cecilia Ogalo suggests that the hedge fund performance should be evaluated by comparing the manager's performance with the median of a universe of hedge funds with similar mandates.

**Required:**

Citing three reasons, explain why Cecilia Ogalo's suggestion for evaluating hedge fund manager performance is inappropriate. (3 marks)

(d) Jackson Omondi, an investment analyst, is currently managing a portfolio with a 65 percent allocation in stocks and 35 percent in bonds. The market value of the portfolio is Sh.200 million.

**Additional information:**

1. The stock has a beta of 1.15.
2. The modified duration of the bond is 6.75.
3. Jackson Omondi intends to increase the stock allocation to 85 percent and decrease the bond allocation to 15 percent for a period of six months.
4. Jackson Omondi also contemplates to increase the beta on the stock position from 1.15 to 1.20 and increase the modified duration of the bonds to 8.25.
5. A stock index futures contract that expires in six months is priced at Sh.157,500 and has a beta of 0.95.
6. A bond futures contract that is expected to expire in six months is priced at Sh.109,000 and has an implied modified duration of 5.25.
7. The stock futures contract has a multiplier of one.

**Required:**

(i) The number of stock futures contracts and the number of bond futures contracts that Jackson Omondi should trade in order to synthetically take the desired position in stock and bonds today. (9 marks)

(ii) Determine whether Jackson Omondi should go short or long based on your answer in (d) (i) above. (1 mark)

(Total: 20 marks)

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**QUESTION TWO**

(a) Explain the following implicit costs in relation to securities trading:

- (i) Slippage costs. (2 marks)
- (ii) Market impact costs. (2 marks)
- (iii) Missed trade opportunity costs. (2 marks)

(b) Simon Murumba, a portfolio manager responsible for a global government bond has been disappointed with the low returns on the current bond portfolio consisting of government bonds relative to the benchmark, which is a diversified global bond index. He is therefore exploring general strategies to generate excess returns on the portfolio. He has already researched on two strategies (duration management strategy and investing in market outside the benchmark index).

**Required:**

Explain three other strategies, excluding the two mentioned above, that Simon Murumba could use to generate excess returns on the current bond portfolio. (6 marks)

(c) Anthony Munyao is evaluating the performance of several asset management firms. A global firm states that its objective is to be a regional specialist in security selection and market allocation. The firm indicates that it seeks to outperform the MSCI Far East Index (MSCI - FEI), an index that captures large and mid-cap representation across three developed markets by:

1. Identifying substantial investment opportunities in under-valued and under-researched securities within the index's country components.
2. Overweighting/underweighting country versus the MSCI - FEI.
3. The global firm further states that it does not practice active currency management as part of its investment strategy.

The recent performance of the firm's growth equity composite is summarised below:

**Global firm growth equity composite**

Country component	Country weights (%)	Rate of return in base currency (%)	Rate of return in local currency (%)	Currency contribution (%)	MSCI-FEI rate of return in local currency (%)
A	30	-4.70	-8.70	4.00	-8.00
B	45	10.40	2.40	8.00	4.00
C	25	15.60	15.60	0.00	7.50
Composite	100	7.17	2.37	4.80	1.28

**MSCI Far East Index (MSCI - FEI)**

Country component	Country weights (%)	Rate of return in base currency (%)	Rate of return in local currency (%)	Currency contribution (%)
A	30	-4.00	-8.00	4.00
B	55	12.00	4.00	8.00
C	15	7.50	7.50	0.00
Composite	100	6.53	0.93	5.60

Note: The country components of the composite have average risk relative to their respective country indexes.

Anthony Munyao has evaluated the contribution of market allocation to the total return of the global firm growth equity composite. He wants to further evaluate the performance of the composite, especially with respect to the global firm's statements about security selection and active currency management.

**Required:**

- (i) Determine the performance of the global firm's growth equity composite relative to the MSCI-FEI in terms of base currency and local currency. (2 marks)
  - (ii) Evaluate whether the contribution of security selection to the total return of the global firm's growth equity composite is consistent with the global firm's stated objective regarding security selection. (3 marks)
  - (iii) Determine whether the contribution of currency movements to the total return of the global firm's growth equity composite is consistent with the global firm's statement about active currency management. (3 marks)
- (Total: 20 marks)**

**QUESTION THREE**

- (a) In the context of portfolio management, distinguish between "performance measurement" and "performance evaluation". (2 marks)
- (b) Describe the following portfolio performance measures:
  - (i) Total rate of return. (1 mark)
  - (ii) Time-weighted rate of return. (1 mark)
  - (iii) Money-weighted rate of return. (1 mark)
  - (iv) Linked internal rate of return (LIRR). (1 mark)
- (c) Joseph Mvurya is a portfolio manager for a global hedge fund which focuses on precious metals, fixed income securities and derivatives. He has a strategy of rolling forward a long position in short dated platinum futures traded on New York Merchantile Exchange (NYMEX). Joseph's expectations are as follows:
  - 1. Electricity supply disruptions in South Africa, the world's dominant platinum producer will cause platinum supply to fall and spot prices to rise.
  - 2. Interest rates will rise.
  - 3. The convenience yield on platinum will increase.

Joseph Mvurya observes that his expectations are not yet reflected in the platinum futures prices.

**Required:**

Assuming that Joseph Mvurya's market expectations are correct, explain the expected change on the following return components:

- (i) Spot return (price return). (2 marks)
  - (ii) Collateral return (collateral yield). (2 marks)
  - (iii) Roll return (roll yield). (2 marks)
- (d) Wananchi Bank has been tasked to finance the construction of a local hospital expansion. The cash flow requirements for the hospital expansion are Sh.20 million in 6 months and an additional Sh.40 million in one year. Wananchi Bank is offering to lend at a floating rate of 90-day Treasury bill plus 50 basis points reset after every six months with a maximum allowable increase of 300 basis points over the initial lending rate for the life of the loan. The entire principal of the Sh.60 million loan is to be repaid at the end of 5 years from today.

Wananchi Bank reviews its interest rate forecasts and decides to fund the hospital loan by issuing a 5-year fixed rate certificate of deposit (CD) when the cash flows will be required. The CD cannot be withdrawn prior to maturity. After six months, Wananchi Bank issues a 5-year fixed rate CD for Sh.20 million to fund the first drawdown. Later, after another six months, Wananchi Bank issues a 5-year fixed rate CD for Sh.40 million to fund the second drawdown. After the second issue, the market value of the assets related to the hospital transactions is Sh.60 million. There is an economic surplus of Sh.4 million related to the hospital transactions.

Immediately after the second drawdown, the assets and liabilities of Wananchi Bank related to the hospital transactions have the following characteristics:

	Assets (loans)	Liabilities (CD)
Modified duration	0.50	4.00
Weighted average maturity (years)	4.00	4.83

**Required:**

- (i) The present value of the liabilities funding the hospital loan immediately after the second drawdown. (3 marks)
- (ii) The change in economic surplus assuming that interest rates increase by 50 basis points for both assets and liabilities. (5 marks)
- (Total: 20 marks)

**QUESTION FOUR**

- (a) A portfolio manager responsible for monitoring a client's portfolio has been tasked to monitor the market and economic changes.

**Required:**

Discuss three areas of market and economic changes that the portfolio manager should monitor in his assignment. (3 marks)

- (b) Silvia Chessetto, an investment analyst, is advising an endowment fund on adding non-domestic assets to its portfolio. The asset allocation of the fund is 60% domestic equities and 40% domestic fixed income. The current portfolio has an expected return of 6.25% with a standard deviation of 9.5%. Silvia is evaluating two new asset classes that might provide a mean-variance improvement for the endowment fund. Silvia provides the endowment trustees with the data shown below:

Asset class	Asset class expectations		
	Expected return (%)	Standard deviation (%)	Correlation with the current portfolio
Non-domestic developed market equity	8.0	14.0	0.70
Emerging market equity	9.0	18.0	0.50

The risk-free rate is 2.0%.

The correlations provided above reflect normal market conditions.

Silvia believes that the use of conditional return correlations is valuable in stress testing.

**Required:**

- (i) Determine if adding non-domestic developed market equity would provide a mean-variance improvement for the current portfolio. (2 marks)
- (ii) Citing two reasons, justify Silvia's belief that the use of conditional return correlations is valuable in stress testing. (2 marks)
- (c) Patrick Mezo is reviewing the performance of the global equity managers of a local university endowment fund. AIK Capital is currently the endowment fund's large capitalisation global equity manager. Performance data for AIK Capital is shown below:

**AIK Capital performance data (2005–2016)**

Average annual rate of return	22.1%
Standard deviation of annual rate of return	16.8%
Beta	1.2

Patrick Mezo also presents the endowment investment committee with performance information for Exodus Asset Management which is another large capitalisation firm. Performance data for Exodus Asset Management is shown below:

**Exodus Asset Management performance data (2005-2016)**

Average annual rate of return	24.2%
Standard deviation of annual rate of return	20.2%
Beta	0.8

Performance data for the relevant risk free asset and market index are shown below:

**Relevant risk-free asset and market index performance data (2005-2016)**

Risk free asset: Average annual rate of return	5.0%
Market index: Average annual rate of return	18.9%
Standard deviation of annual rate of return	13.8%

**Required:**

Calculate the Sharpe ratio and Treynor's performance measure for both AIK Capital and Exodus Asset Management.

(4 marks)

- (d) Using the information in (c) above, calculate the following components of investment performance for Exodus Asset Management:
- (i) Overall performance. (1 mark)
  - (ii) Risk. (1 mark)
  - (iii) Selectivity. (1 mark)
  - (iv) Diversification. (1 mark)
  - (v) Net selectivity. (1 mark)
- (e) Using the information in (c) above, explain why different rankings of AIK Capital and Exodus Asset Management could result from using:
- (i) The Sharpe ratio versus the Treynor's measure. (2 marks)
  - (ii) Overall performance versus net selectivity. (2 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) Explain four reasons why a fixed income dealer might prefer to trade his bond portfolio in a secondary market. (4 marks)
- (b) A portfolio manager decided to purchase corporate bonds with a market value of Sh.5 million. To finance 60 percent of the purchase, the portfolio manager entered into a 30-day repurchase agreement (repo) with a bond dealer. The 30-day term repo rate was 4.6 percent per annum. At the end of 30 days, the bonds purchased by the portfolio manager had increased in value by 0.5 percent and the portfolio manager decided to sell the bonds. No coupons were received during the 30-day period.

**Required:**

- (i) Compute the 30-day rate of return on the equity and borrowed components of the portfolio. (3 marks)
- (ii) Calculate the 30-day portfolio rate of return. (2 marks)
- (iii) Compute the 30-day portfolio rate of return, if the increase in value of the bonds was 0.3 percent instead of 0.5 percent. (2 marks)

- (c) Mark Mutiso works for a global investment firm. His client wishes to capture excess equity returns from small capitalisation United States (US) stocks while simultaneously establishing exposure to the large capitalisation US equity market. Mark has determined that the Russell 2000 index and the standard and poor (S & P 500) index are the appropriate small capitalisation and large capitalisation benchmarks respectively. Mark proposes the following two strategies:

**Strategy one:**

- Hire an equity manager who has consistently outperformed the Russell 2000 index.
- Buy the same dollar amount of Russell 2000 futures exposure.
- Sell short the same dollar amount of S & P 500 index futures exposure.

**Strategy two:**

- Hire a market neutral (long/short) small capitalisation manager.
- Buy the same dollar amount of S & P 500 index futures exposure.

**Required:**

Explain whether each of the above strategies would achieve the client's objectives.

(4 marks)

(d) Clement Kivuti is a portfolio manager at PM Hedge Fund (PMHF). PMHF holds a four-year Sh.120 million, 6% fixed rate bond that pays interest semi-annually. Clement expects four-year interest rates to rise. He intends to reduce the duration of the bond position. An analyst at PMHF suggests that Clement can reduce the modified duration of this position which is currently 3, to a more acceptable duration of 0.3 by using an interest rate swap. Clement estimates the notional principal on the swap to be as close as possible to the Sh.120 million principal of the original bond.

The analyst provides Clement with the following four possible swaps:

**Available swap position**

Swap	Type of swap	Term of the swap	Frequency of payment
1	Pay fixed, receive floating	2 years	Semi-annually
2	Pay floating, receive fixed	4 years	Quarterly
3	Pay fixed, receive floating	4 years	Quarterly
4	Pay floating, receive fixed	2 years	Semi-annually

Assume that the modified duration of the fixed-rate component of a swap is 75% of its maturity.

**Required:**

Advise Clement Kivuti on the swap that meets the stated goals.

(5 marks)

(Total: 20 marks)

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# KASNEB

## CIFA PART III SECTION 6

### ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 24 November 2016.

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) Enumerate three roles that could be played by brokers and dealers when executing portfolio decisions in the financial market. (3 marks)
- (b) Financial markets are organised to provide liquidity, transparency, and assurance of completion, so that they might be judged by the degree to which they have these qualities in practice.

**Required:**

In the context of the above statement:

- (i) Examine three characteristics of a liquid market. (3 marks)
- (ii) Discuss two factors that could contribute to market illiquidity. (2 marks)
- (c) Jamboleo Ltd. is a listed company on MSE, a local securities exchange in your country. On Monday, 10 November 2016 at 11.42 a.m. James Munene, a trader, sold 150 shares of Jamboleo Ltd. at a price of Sh.813.30 per share. The table below encompasses all trades for Jamboleo Ltd.'s share for that day:

Time	Trade price (Sh.)	Volume of shares traded
8.30 AM	807.30	450
8.48 AM	808.08	300
11.28 AM	815.42	900
11.42 AM	813.30	150
11.58 AM	815.16	450
12.58 PM	818.76	750
2.59 PM	809.01	450

James Munene is evaluating the implicit costs of the trade, putting his main focus on the bid-ask spread and market impact using specified price benchmarks.

**Required:**

The estimated implicit transaction costs using each of the following price benchmarks:

- (i) Opening price. (2 marks)
- (ii) Closing price. (2 marks)
- (iii) Volume-weighted average price (VWAP). (5 marks)
- (d) Assume that the spread between a Ugandan bond and a Tanzanian bond is 300 basis points. This spread provides Tanzanian investors who purchase Ugandan bonds with an additional yield income of 75 basis points per quarter. The duration of the Tanzanian bonds is 8.3.

**Required:**

Determine the decline in the interest rate that would be needed to completely wipe out the quarterly yield advantage for the Tanzanian investor assuming that the Tanzanian interest rate declines. (3 marks)

(Total: 20 marks)

#### QUESTION TWO

- (a) In the context of portfolio management, discuss the following portfolio rebalancing strategies:

- (i) Calendar rebalancing. (2 marks)
- (ii) Percentage-of-portfolio rebalancing. (2 marks)

- (b) Julius Poipoi, a self employed person who receives his income irregularly, has an investment account with Centurus Investment Firm. On 1 June 2016, he had a balance of Sh.150,000 in his account. On 13 June 2016, he deposited Sh.4,500 into his account. Further to that, on 20 June 2016, he deposited Sh.3,750.

His account was valued at Sh.157,500 and Sh.162,000 after the first and second contribution respectively. At the end of June 2016, his account was valued at Sh.165,000.

**Required:**

The time-weighted rate of return for the investment. (4 marks)

- (c) Andrew Koech, a portfolio manager with Smith Capital, wishes to increase the beta for one of the portfolios he manages from 0.9405 to 1.188 for a three-month period. The current market value of the portfolio under consideration is Sh.173,250,000. Smith Capital contemplates to use a futures contract priced at Sh.104,732.10 so as to adjust the portfolio beta. The beta of the futures contract is 0.9702.

**Required:**

(i) The number of futures contracts that should be bought or sold to achieve an increase in the portfolio beta of 1.188. (2 marks)

(ii) The value of the overall position and the effective beta of the portfolio assuming that the overall equity market goes up by 5.445% at the end of three months, while the stock portfolio under management also rises by 5.049% and that the futures contract is priced at Sh.110,385. (4 marks)

- (d) Ivy Kigen is considering an investment in distressed debt. She uses a 3-year horizon for evaluating the investment. Ivy Kigen analyses Jumia Capital, a newly distressed debt hedge fund and notes the following:

1. The annual management fee based on average net asset value (NAV) is 1%.
2. The performance fee paid monthly and calculated based on the monthly change in NAV, subject to a high water mark provision is 15%.
3. The lock up period is 3 years.
4. 14% of NAV is invested in a distressed airline company that recently filed for bankruptcy protection.
5. Net asset value per unit at the end of May 2016 was a new all time high of Sh.3,100.

Jumia Capital's subsequent month end NAV per unit was Sh.3,260 in June 2016, Sh.2,900 in July 2016 and Sh.3,140 in August 2016. There were no interim cash flows from clients during this three-month period.

Ivy Kigen learns of a competing distressed debt hedge fund with a similar performance fee and expected return, but only 1-year lock up period. She contacts Jumia Capital and states that she is considering investing in the competitor's fund. A representative for Jumia Capital replies that its 3-year lock up period is likely to be more favourable to Ivy Kigen than the competitor's 1-year lock up period.

**Required:**

(i) The performance fee (in Sh. per unit) for the three months from June 2016 to August 2016. (2 marks)

(ii) Explain why Jumia Capital is subject to J-factor risk. (2 marks)

(iii) Support the representative's reply about Jumia Capital's lock-up period. (2 marks)

(Total: 20 marks)

**QUESTION THREE**

(a) Explain three reasons why an investor would consider investing in an indexed portfolio. (3 marks)

(b) Examine three approaches that an investment analyst could use to hedge against currency risk. (3 marks)

(c) An investor decides to pursue a contingent immunisation strategy over a 3-year time horizon. The investor has Sh.20 million to invest. The available 3-year immunisation rate is 4% and the investor will accept a minimum safety net return of 3.2%.

**Required:**

The initial surplus amount for the investor. (3 marks)

- (d) George Orengo is an investment analyst at an asset management firm. Each year, he provides his firm with a report that includes a series of market forecasts. As part of his report, he uses the Grinold-Kroner model to forecast the expected rate of return on equities for the next 10 years. He uses the data below to prepare his forecast:

Factor	10-year forecast (annualised) (%)
• Dividend yield	1.80
• Dividend growth rate	4.00
• Change in price to earnings (P/E) multiple	0.50
• Inflation rate	1.20
• Change in the number of shares outstanding	-0.30
• Real total earnings growth rate	2.50

**Required:**

Using Grinold-Kroner model, calculate the following sources of return for equities:

- (i) Expected nominal earnings growth return. (1 mark)
- (ii) Expected repricing return. (1 mark)
- (iii) Expected income return. (1 mark)
- (e) Simon Mbatia, a fixed income portfolio manager, manages a domestic bond fund. He is contemplating whether to purchase a 5-year callable, BBB rated corporate bond for the fund. The corporate bond's current yield is 4.90%. Simon Mbatia intends to use the risk-premium approach to decide on whether to purchase the bond for the fund. The trailing 12-month inflation rate is 1.10% and it is expected to remain constant at 1.50% per annum for the next five years. It is assumed that the illiquidity discount and tax premium are both zero.

The following information relates to the domestic bond market data:

- Real risk-free interest rate is 1.30%
- 1-year BBB rated credit risk spread (Over Treasuries) is 30 basis points.
- 5-year BBB rated credit risk spread (Over Treasuries) is 80 basis points.
- Spread of 5-year Treasury over 1-year Treasury is 100 basis points.
- 1-year call risk spread is 20 basis points.
- 5-year call risk spread is 60 basis points.

**Required:**

Based on the risk-premium approach, advise whether Simon Mbatia should purchase the corporate bond. (4 marks)

- (f) Anthony Wekesa, a fixed income portfolio manager intends to add another bond to his portfolio. He uses mean-reversion analysis to determine the bond to purchase among the three bonds identified below:

Bond	Credit spread and standard deviation in basis points (bps)		
	Current Spread	Historical mean spread	Standard deviation of spread
A	300	210	50
B	320	230	30
C	340	240	40

The three bonds proposed above have similar durations, their credit spreads are normally distributed, and no structural changes are expected in the market.

**Required:**

Advise the portfolio manager on the most appropriate bond to purchase using the mean-reversion analysis approach.

(4 marks)

(Total: 20 marks)

**QUESTION FOUR**

- (a) Assess how the following behavioural factors could influence asset allocation policy:

- (i) Loss aversion. (2 marks)
- (ii) Mental accounting. (2 marks)

(b) The following information relates to micro attribution analysis for a portfolio manager:

Sector	Portfolio weight (%)	Benchmark weight (%)	Portfolio return (%)	Benchmark return (%)
Agriculture	21.53	28.70	9.47	4.16
Energy	34.91	45.44	8.21	5.43
Financial	31.35	11.79	6.82	4.98
Technology	12.21	14.07	-9.02	-1.71
Total portfolio	100.00	100.00	5.94	4.01

The manager's objective is to outperform the benchmark through superior security selection.

**Required:**

Calculate each of the following returns for the portfolio manager:

- (i) Pure-sector allocation return for the financial sector. (2 marks)
- (ii) Within-sector selection return for the technology sector. (2 marks)

(c) Anderson Mwadima is the portfolio manager for the Sh.200 million Natural Industries defined benefit pension fund. He is planning to make a presentation to the trustees of the pension plan. His firm has come up with long term capital market expectations as shown below:

Asset class	Expected return (%)	Expected standard deviation (%)	Correlations					
			1	2	3	4	5	
Domestic equity	12.00	16.00	1.00					
Domestic bonds	8.25	6.50	0.32	1.00				
International equity	14.00	18.00	0.46	0.22	1.00			
International bonds	9.25	12.25	0.23	0.56	0.32	1.00		
Alternative investments	11.50	21.00	0.25	0.11	0.08	0.06	1.00	

Using the capital market expectations, the portfolio manager identifies an efficient frontier with six corner portfolios with the characteristics shown below:

Corner portfolio	Expected return (%)	Expected standard deviation (%)	Sharpe ratio	Asset class weights				
				Domestic equity (%)	Domestic bonds (%)	International equity (%)	International bonds (%)	Alternative investments (%)
1	14.00	18.00	0.639	0.00	0.00	100.00	0.00	0.00
2	13.66	16.03	0.696	0.00	0.00	85.36	0.00	14.64
3	13.02	13.58	0.775	21.69	0.00	56.56	0.00	21.75
4	12.79	13.00	0.792	21.48	0.00	52.01	5.24	21.27
5	10.54	8.14	0.988	9.40	51.30	26.55	0.00	12.76
6	8.70	6.32	0.981	0.00	89.65	4.67	0.00	5.68

**Additional information:**

1. The trustees have established a spending rate of 8.50%. Inflation is expected to be 2% per annum and the cost of managing the fund is expected to be 0.40%. The trustees would like to preserve the purchasing power of the fund and are concerned with multi period compounding issues.
2. The majority of plan participants are young, therefore additional liquidity needs are minimal.
3. The trustees would like to limit risk as defined by standard deviation to not more than 10% per year.

**Required:**

- (i) The fund's required rate of return. (2 marks)
- (ii) The appropriate strategic asset allocation for each asset class. (4 marks)
- (iii) The Sharpe ratio of the market and the risk-free rate. (4 marks)
- (iv) Advise on whether a risk-free asset should be included as an asset. (2 marks)

(Total: 20 marks)

**QUESTION FIVE**

(a) In relation to equity portfolio management, evaluate five advantages of short-extension strategies. (5 marks)

(b) Anthony Kioko is a small-cap growth manager who invests in domestic equities. He was hired by a pension fund that benchmarks him against a broad domestic market index provided below:

- Manager's return 18.0%
- Broad market return 15.0%
- Normal portfolio return 20.0%
- Total active risk 5.0%
- Misfit active risk 3.5%

**Required:**

(i) The true active risk. (3 marks)

(ii) Determine the manager's information ratio. (2 marks)

(c) Sukuk is a hedge fund that uses derivatives in its portfolio. A financial analyst is reviewing Sukuk's credit risk exposure. The firm's policy is to use a different counterparty for each derivative holding to limit its credit exposure to any single counterparty. Its current derivative holdings are shown below:

Holding	Description	Notional principal Sh.	Current value Sh.
• Interest rate swap	1-year, quarterly payments; pay floating, receive fixed	2,000,000	56,000
• Forward contract	2 years long natural gas	5,000,000	-225,000
• Option	6 months; long call option on domestic equity index	5,000,000	487,000

All derivatives are traded over the counter (OTC) and are not subject to collateral requirements.

**Required:**

The hedge fund's total amount at risk of credit loss from its derivatives under its current policy. (4 marks)

(d) Paul Ng'ang'a, a portfolio manager for Arab Energy's European technology fund is concerned about currency fluctuations related to the equity portfolio. The portfolio is valued in United States Dollars (USD) but has exposure to multiple European currencies, primarily the Euro (EUR).

The portfolio manager formulates the following market expectations for the coming year:

- Expected return (in EUR) of the portfolio is 13.2%
- Standard deviation (in EUR) of the portfolio is 15%
- Expected USD/EUR spot rate in one year is 1 EUR = 1.2045 USD
- Standard deviation of the USD/EUR exchange rate is 5%
- Correlation between the USD/EUR exchange rate and the portfolio in (EUR) is -0.07

The market quotes indicated below are available from a currency dealer:

- USD/EUR spot rate 1.1930
- 1-year USD/EUR forward rate (bid-offer) 1.2065 – 1.2090

Paul Ng'ang'a is contemplating selling EUR and buying USD using a 1-year forward contract to fully hedge the EUR currency risk. He will execute the trade if he can achieve the following risk-return objectives:

**Objective 1:** Increase the portfolio's expected return (in USD) by at least 25 basis points (bps).

**Objective 2:** Reduce the portfolio's expected standard deviation in USD by at least 30 basis points (bps).

**Required:**

Based on Paul Ng'ang'a's market expectations, determine whether he should execute the formal trade with respect to each of the following risk-return objectives:

(i) Objective 1. (3 marks)

(ii) Objective 2. (3 marks)

(Total: 20 marks)

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## CIFA PART III SECTION 6

### ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 26 May 2016.

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) Discuss the following enhanced bond indexing strategies as identified by Kenneth E. Volpert (2000):
- (i) Lower cost enhancements. (1 mark)
  - (ii) Issue selection enhancements. (1 mark)
  - (iii) Yield curve positioning. (1 mark)
  - (iv) Sector and quality positioning. (1 mark)
  - (v) Call exposure positioning. (1 mark)
- (b) Highlight three assumptions of classical bond immunisation theory. (3 marks)
- (c) The investment committee of RBC Bank Ltd.'s pension scheme is not pleased with the recent performance of the fixed-income portion of their investment and have fired the fixed-income manager. The investment committee has hired a consultant from Alexandria Financial Services (AFS) to assess the portfolio's risks, submit recommendations to the committee, and manage the portfolio on its behalf on an interim basis. The current portfolio benchmarked against an index is shown in Table I below:

Table I: RBC Bank Ltd.'s pension scheme fixed-income portfolio information:

Sector	Portfolio		Index	
	%	Duration	%	Duration
Treasury	47.74	5.50	49.67	5.96
Agencies	14.79	5.80	14.79	5.10
Corporates	12.35	4.50	16.54	5.61
Mortgage-backed securities	25.12	4.65	19.10	4.65

**Note:** Spread durations are the same as effective durations for all sectors with similar spread risk.

The consultant has noticed that the fired manager's portfolio did not constitute securities outside of the index universe. The investment committee has requested him to consider an indexing strategy including related benefits and logical problems.

The consultant has identified the undermentioned three factors that had limited the manager's ability to replicate a bond index:

1. Lack of availability of certain bond issues.
2. Limited market capitalisation of the bond universe.
3. Differences between the bond prices used by the manager and the index provider.

After conducting further analysis of the current treasury securities portion of the portfolio, the consultant discovers that there was a significant overweight in a 5-year treasury bond (Sh.10 million par value). He anticipates the yield curve to flatten and forecasts a six-month horizon price of the 5-year treasury bond to be Sh.99.50. Therefore, his strategy will be to sell 5-year treasury bonds and invest the proceeds in 10-year treasury bonds and cash while maintaining the dollar duration of the portfolio.



The Treasury bond information is shown in Table II below:

**Table II:** Treasury bond information:

Tenor (Years)	Coupon (%)	Maturity date	Duration	Price (Sh.)	Yield (%)
5-year	4.125	15 May 2011	4.53	100.40625	4.03
10-year	5.250	15 May 2016	8.22	109.09375	4.14

**Note:** Prices are shown per Sh.100 par value.

**Required:**

- (i) The duration of the RBC Bank Ltd.'s pension scheme fixed income portfolio with reference to the information given in Table I above. (2 marks)
  - (ii) Using the information given in Table I, compute the spread duration of RBC Bank Ltd.'s fixed-income portfolio. (2 marks)
  - (iii) Based on the data in Table I, identify, giving an appropriate reason, the bond portfolio strategy used by the fixed manager. (1 mark)
  - (iv) In relation to the three factors identified by the consultant, describe the factor that is least likely to limit a manager's ability to replicate a bond index. (1 mark)
  - (v) Using the consultant's forecasted price and the bond information given in Table II, calculate the expected 6-month total return of the 5-year, 4.125% treasury bond. (Assume zero accrued interest at purchase). (2 marks)
  - (vi) With reference to the information given in Table II, estimate the par value of the 10-year bonds to be purchased to execute the consultants' strategy. (4 marks)
- (Total: 20 marks)**

**QUESTION TWO**

- (a) In relation to relative value analysis, evaluate the following tools used by fixed income portfolio managers when analysing yield spread levels:
  - (i) Mean-reversion analysis. (2 marks)
  - (ii) Quality spread analysis. (2 marks)
  - (iii) Per cent yield spread analysis. (2 marks)
- (b) Peterson Orengo, a portfolio manager with Beta Asset Managers (BAM) decided to buy corporate bonds with a market value of Sh.5 million. To finance 60 per cent of this purchase, Peterson entered into a 30-day repurchase agreement (repo) with the bond dealer. The 30-day term repo rate was 4.6 per cent per annum. At the end of the 30 days, the bonds purchased by Peterson had increased in value by 0.5 per cent and Peterson decided to sell the bonds. No coupons were received during the 30-day period.

**Required:**

- (i) The 30-day rate of return on the equity and the borrowed components of the portfolio. (3 marks)
- (ii) The 30-day portfolio rate of return. (2 marks)
- (iii) The 30-day portfolio rate of return assuming the increase in value of the bonds was 0.3% instead of 0.5%. (2 marks)
- (iv) Based on the result obtained in (b)(ii) and (b)(iii) above, comment on the effect of leverage on the portfolio rate of return. (2 marks)
- (v) Explain the reason why the bond dealer faces credit risk even if he holds the collateral. (1 mark)

- (c) Anthony Wanyagia, an equity portfolio manager, has reviewed the holdings of the existing large cap portfolio and has asked his trader to sell the four securities illustrated below:

Trade order and market data					
Security	Order size (shares)	Average daily volume (shares)	Bid-ask Spread	Share price (Sh.)	Urgency to complete trade
A	15,000	812,000	Wide	15.50	Low
B	48,000	972,000	Narrow	12.50	Low
C	3,000	77,000	Narrow	9.80	High
D	19,000	59,000	Narrow	7.50	High

**Required:**

Using the data provided, justify the security for which each of the following trade execution tactics is most appropriate:

- (i) Volume weighted average price (VWAP) algorithm. (2 marks)
- (ii) Implementation shortfall algorithm. (2 marks)
- (Total: 20 marks)**

**QUESTION THREE**

- (a) Highlight three limitations of holdings-based style analysis compared to returns-based style analysis. (3 marks)
- (b) Giving four reasons, justify why some investors believe that more price inefficiency could be found on the short side of the market than on the long side of the market. (4 marks)
- (c) Vincent Nderi is a pension consultant and is tasked to evaluate the following portfolios:
- Portfolio 1:** A highly concentrated portfolio with five stocks representing 75% of the total portfolio.
  - Portfolio 2:** A highly diversified portfolio with over 400 stocks, none of which represent more than 1% of the total portfolio.
  - Portfolio 3:** A diversified portfolio of 70 stocks, with the top ten names representing 30% of the total portfolio.

The following investment results were recorded in the year 2015:

	Portfolio 1	Portfolio 2	Portfolio 3	Market Index
Return (%)	42.0	25.0	16.0	20.0
Standard deviation	1.20	0.40	0.20	0.50
Beta	1.80	1.20	0.50	1.00

The risk free rate is 6%.

**Required:**

For each portfolio, calculate and interpret the following:

- (i) Treynor measure. (2 marks)
- (ii) Modigliani-Modigliani ( $M^2$ ) measure. (2 marks)
- (iii) Jensen measure. (2 marks)
- (d) Mike Mutivo, a portfolio manager at Kancom Capital, made the following transactions in CMS Limited shares for a portfolio that he manages:
- Day 1: At market close, CMS Limited shares are priced at Sh.75.
- Day 2: Before the market opens, he decides to buy 8,000 shares at Sh.74 per share by placing a limit order that would expire at the end of the day. The limit order does not fill and the CMS Limited shares close the day at Sh.75.75. After the market closes, the company announces that it has entered into a joint venture which would expand its international presence. Mike assumes that this announcement could make the price of the company move up or down by Sh.1.00.

Day 3: He places a new limit order to buy 8,000 shares of CMS Limited at a price of Sh.77. As the trading day nears to an end, 4,000 shares fill at Sh.77 per share plus Sh.1,500 in commission. CMS Limited shares close at Sh.79 that day and the remaining 4,000 shares are never purchased.

**Required:**

The total amount of implementation shortfall for CMS Limited's shares transaction. (3 marks)

- (e) Elimu Foundation has received a Sh.20 million global government bond portfolio from a German donor. This bond will be denominated in Shillings and managed separately from Elimu Foundation's non-shilling denominated bonds. The bond portfolio is currently hedged and the Chief Finance Officer of Elimu Foundation is considering whether to hedge the currency risk of the portfolio.

The bond portfolio's current allocation and relevant country performance data are given below:

**Elimu Foundation  
Current Allocation  
Global Government Bond Portfolio**

Country	Allocation (%)	Maturity (years)
Germany	25	5
A	40	5
B	10	10
C	10	5
D	15	10

**Country Performance Data  
(in local currency)**

Country	Cash return (%)	5-year excess bond return (%)	10-year excess bond return (%)	Unhedged currency return (%)
Germany	2.0	1.5	2.0	-
A	1.0	2.0	3.0	-4.0
B	4.0	0.5	1.0	2.0
C	3.0	1.0	2.0	-2.0
D	2.6	1.4	2.4	-3.0

**Required:**

The expected total annual return of the current bond portfolio. (Assume that the Chief Executive Officer of the foundation decides to leave the currency risk unhedged). (4 marks)

**(Total: 20 marks)**

**QUESTION FOUR**

- (a) Describe how integrating the Black-Litterman approach into the asset allocation process would affect the following:
- (i) Specification of expected return. (2 marks)
  - (ii) Level of market diversification of the resulting portfolio. (2 marks)
- (b) James Kiptoo, a Portfolio Manager, intends to purchase 5,000 shares of EAP Ltd., which had an initial public offer (IPO) recently. However, James was not able to get any shares at the IPO price of Sh.30 per share. James would still like to purchase the 5,000 shares, but not at a price above Sh.45 per share.

**Required:**

- (i) Giving an appropriate reason, explain whether James should place a market order or a limit order. (1 mark)
  - (ii) Evaluate one advantage and one disadvantage of the preferred order in (b)(i) above. (2 marks)
- (c) Johnson Makau, a CFA graduate working as a Portfolio Manager with East Africa Financial Services (EAFS), expects to receive a cash inflow of Sh.50 million in three months time. Johnson intends to use futures contracts to take a Sh.17.5 million synthetic position in stocks and Sh.32.5 million in bonds today.

**Additional information:**

1. The stock would have a beta of 1.15.
2. The bonds would have a modified duration of 7.65.
3. A stock index futures contract with a beta of 0.93 is priced at Sh.175,210.
4. A bond futures contract with a modified duration of 5.65 is priced at Sh.95,750.
5. When the futures contract expires in three months, stocks and bonds will have declined by 5.4% and 3.06% respectively.

**Required:**

- (i) The number of stock and bond futures contracts that Johnson Makau would have to trade in order to synthetically take the desired position in stocks and bonds today. (7 marks)
  - (ii) Show that profits on the futures positions are essentially the same as the change in the value of stocks and bonds during the three-month period. (6 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) Evaluate three practical risk management benefits that might accrue to an investment manager who keeps rebalancing his clients' portfolios. (3 marks)
- (b) Discuss four biases that could arise in the hedge fund benchmark selection. (4 marks)
- (c) Jamal Shah holds an investment account with Fahali Financial Services (FFS), a local investment firm based in her country. Jamal makes contributions to her account based on availability of funds. Being a business person, Jamal receives money from her clients on an irregular basis. By 1 June 2015, her account had Sh.100,000. On 14 June 2015, Jamal received Sh.3,000 and deposited the amount to her account the same day. On 21 June 2015, she received Sh.2,500 and made another contribution to her account. The value of her account after the 14 June 2015 contribution was Sh.105,000, and her account value after the 21 June 2015 contribution was Sh.108,000. Jamal's account was valued at Sh.110,000 on 30 June 2015.

**Required:**

Jamal Shah's time-weighted rate of return. (6 marks)

- (d) A Japanese company issues a corporate bond with a face value of ¥1.2 billion and a coupon rate of 5.25 per cent. The company decides to use a swap to convert this bond into a euro-denominated bond. The current exchange rate is ¥120/€. The fixed rate on euro-denominated swaps is 6 per cent, and the fixed rate on yen-denominated swaps is 5 per cent.

(Note: All payments will be made annually, so there is no adjustment such as Days/360).

**Required:**

- (i) Describe the terms of the swap and identify the cash flows at the start. (3 marks)
  - (ii) Identify all interest cash flows at each interest payment date. (2 marks)
  - (iii) Identify all principal cash flows at the maturity of the bond. (2 marks)
- (Total: 20 marks)**
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## CIFA PART III SECTION 6

### ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 26 November 2015.

Time Allowed: 3 hours.

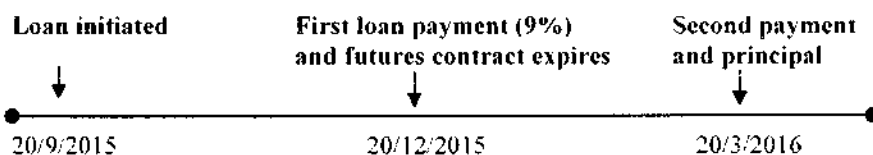
Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

#### QUESTION ONE

- (a) Discuss five criteria that could assist a portfolio manager in appropriately specifying asset classes. (5 marks)
- (b) George Onyango is considering a possible six-month, Sh.100 million LIBOR based floating-rate bank loan to fund an infrastructure project. However, he fears that there might be a possible rise in the LIBOR rate by December 2015 and intends to use December 2015 Eurodollar futures contract to hedge risk.

The futures contract expires on 20 December 2015, has a Sh.1 million contract size, and a discount yield of 7.3%. George Onyango will ignore the cash flow implications of marking-to-market, initial margin requirements and any timing mismatch between exchange traded futures contract cash flows and the interest payments due in March 2016. The terms of the loan are as shown below:

20 September 2015	20 December 2015	20 March 2016
<ul style="list-style-type: none"><li>Borrow Sh.100 million at 20 September 2015 LIBOR + 200 basis points (bps)</li></ul>	<ul style="list-style-type: none"><li>Pay interest for the first three months</li><li>Roll loan over at 20 December 2015 LIBOR + 200 bps</li></ul>	<ul style="list-style-type: none"><li>Pay back principal plus interest</li></ul>



#### Required:

- (i) Formulate George Onyango's 20 September 2015 floating-rate to fixed-rate strategy using the Eurodollar futures contract. (5 marks)
- (ii) Show that the strategy in (b) (i) above would result in a fixed rate loan, assuming an increase in the LIBOR rate to 7.8% by 20 December 2015 which remains at 7.8% through 20 March 2016. (5 marks)
- (c) The market value of an emerging market-fixed income investment fund is Sh.74.9 million. The duration of the portfolio is 8.165. According to a consulting economist, the prevailing interest rates are likely to have an unexpected decline over the next month. Based on this forecast, the portfolio manager contemplates increasing the duration of the fund's entire bond duration to 10.11. The futures contract that the fund would use is currently priced at Sh.130.012 and has a duration of 9.356. It is also assumed that the conversion factor for the futures contract is 1.059.

#### Required:

- (i) Explain whether the fund would need to buy or to sell the futures contract. Justify your answer. (1 mark)
- (ii) The approximate number of futures contracts that would be needed to change the duration of the bond portfolio. (4 marks)

(Total: 20 marks)

#### QUESTION TWO

- (a) Explain the following fixed income portfolio management strategies:
- (i) Full replication approach. (2 marks)
- (ii) Enhanced indexing by matching primary risk factors. (2 marks)
- (iii) Enhanced indexing by small risk factor mismatches. (2 marks)

- (iv) Active management by larger risk factor mismatches. (2 marks)
- (v) Full-blown active management. (2 marks)
- (b) Evaluate three components of return for commodities futures contracts. (6 marks)
- (c) Justine Kangongo is a senior portfolio manager advising international clients. On 1 September 2015, one of Kangongo's clients, an American, bought a Canadian oil company for 1 million CAD (Canadian dollars) and sold Canadian stock index futures (December maturity) for the same amount to hedge the Canadian stock market risk. The stock index futures contract has a multiplier of CAD 25. The current stock index futures price is CAD 2,000. The client sells 20 contracts. The Canadian dollar dropped from 1.0 United States dollars (USD) on 1 September 2015 to 0.90 USD on 1 October 2015. During the same period, the stock index and stock index futures dropped by 10% in CAD, while the portfolio only loses by 7% in CAD.

**Required:**

The profit or loss of this alpha strategy in USD given that the client does not engage in currency hedging. (4 marks)  
**(Total: 20 marks)**

**QUESTION THREE**

- (a) (i) In relation to global credit bond portfolio management, explain the term "relative value". (2 marks)
- (ii) Describe three strategic portfolio implications of the bullet structure with an immediate maturity. (6 marks)
- (b) A portfolio manager is evaluating two new asset classes that might provide a mean-variance improvement for his portfolio. He gathers the following data:

Asset class	Asset class expectations		Correlation with the current portfolio
	Expected return	Standard deviation	
Non-domestic developed market equity	8.0%	14.0%	0.70
Emerging market equity	9.0%	18.0%	0.50

**Additional information:**

- The risk free rate is 2.0%.
- The current portfolio consists of 60% domestic equities and 40% domestic fixed-income securities.
- The current portfolio has an expected return of 6.25% and a standard deviation of 9.5%.

**Required:**

Using Sharpe ratio, determine whether an addition of non-domestic developed market equity would provide a mean-variance improvement to the current portfolio. (3 marks)

- (c) Charles Keter presented the following performance result. The manager invests in a small number of sectors within a broad equity universe. The objective of the manager is to outperform a custom benchmark:

Industry sector	Performance results			
	weight (%)		Return %	
	Portfolio	Custom benchmark	Portfolio	Custom benchmark
Agricultural	21.30	21.90	4.55	4.90
Banking	36.00	34.80	3.60	3.10
Investment	19.20	20.90	3.90	3.30
Telecommunication and technology	23.50	22.40	1.30	-0.20
Total portfolio	100.00	100.00	3.42	2.80

**Required:**

- (i) The pure sector allocation for the agricultural sector of the portfolio. (3 marks)
- (ii) The within-sector allocation (security selection) return for the investment sector of the portfolio. (3 marks)
- (iii) The allocation (selection interaction) return for the banking sector of the portfolio. (3 marks)

**(Total: 20 marks)**

#### QUESTION FOUR

- (a) Examine five limitations of Sharpe ratio as a performance appraisal measure of a hedge fund. (5 marks)
- (b) John Kioko, a Chief Investment Officer (CIO) of a large pension fund has prepared the performance attribution table shown below to assist in evaluation of the performance of the equity real estate portfolio:

Portfolio type	Portfolio allocation	Index allocation	Portfolio returns	Index return
	%	%	%	%
Office	55	35	4.47	6.07
Retail	20	25	8.23	7.51
Warehouse	20	15	6.01	7.52
Apartment	5	25	0.76	2.94
Total	<u>100</u>	<u>100</u>		

**Required:**

- (i) Index return. (1 mark)
- (ii) Effects of property selection. (2 marks)
- (iii) Effects of market timing. (2 marks)
- (iv) Active return. (2 marks)
- (v) Effects of active management. (2 marks)
- (c) Jack Sitoti, an investment consultant, has collected the following information which he considers appropriate to compare the performance of two managers; Manager 1 and Manager 2.

Performance measure	Five year performance (annualised)	
	Manager 1	Manager 2
Rate of return (%)	21.13	21.13
Sharpe ratio	1.17	1.21
M <sup>2</sup> (%)	18.72	19.27
Active risk (%)	2.17	4.18
Information ratio	0.52	0.27
Treynor measure (%)	19.15	17.17
Risk-free rate (%)	2.75	2.75

**Required:**

- Using three risk-adjusted performance measures, explain the causes of the difference in the two managers' performance. (6 marks)
- (Total: 20 marks)

#### QUESTION FIVE

- (a) Evaluate three economically significant differences that distinguish "conventional index mutual funds" from "indexed exchange traded funds (ETF)". (6 marks)
- (b) Describe the following portfolio rebalancing strategies:
- (i) Buy-and-hold strategy. (2 marks)
- (ii) Constant-mix strategy. (2 marks)
- (iii) Constant-proportion portfolio insurance (CPPI) strategy. (2 marks)

- (c) As a portfolio manager of Fiduciary Investment Services (FIS), one of your duties is to ensure timely execution of trades ordered by the clients.

The following information relates to one of your clients:

1. A client ordered for 1,000 shares of East African Cotton Limited (EACL) to be purchased on Tuesday, with a benchmark price of Sh.10 per share.
2. On Tuesday, 600 shares were purchased at a price of Sh.10.02 per share. The commissions and fees for this trade was Sh.20.00. The closing price on that Tuesday was Sh.9.99 per share.
3. On Wednesday, 100 more shares were bought at Sh.10.08 per share with commissions and fees amounting to Sh.12.00. The closing price was Sh.10.01 per share on that day.
4. The remaining shares were not purchased and the order was cancelled on Thursday at the close of the market. EACL shares closed at Sh.10.05 per share on Thursday.

**Required:**

- (i) Implementation shortfall for the above trade. (4 marks)
- (ii) Components of the implementation shortfall for the above trade. (4 marks)

**(Total: 20 marks)**

.....



Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7025	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0643	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

\* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{t=1}^n \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of Payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3202	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0061	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1861	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0739	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4623	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0839	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

# KASNEB

## CIFA PART III SECTION 6

### ADVANCED PORTFOLIO MANAGEMENT

#### PILOT PAPER

September 2015.

Time Allowed: 3 hours.

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

#### QUESTION ONE

(a) Explain how asset allocation policy is influenced by the following:

- (i) Loss aversion. (2 marks)
- (ii) Mental accounting. (2 marks)
- (iii) Fear of regret. (2 marks)

(b) A perpetual foundation needs a 5% current distribution, expenses of 0.5% and expected general inflation of 2%. However, inflation relating to the foundation's distribution is 3%.

**Required:**

- (i) Additive required rate of return. (2 marks)
- (ii) Compounded required return. (2 marks)

(c) Suppose an investor requires before-tax return of 8%, has risk aversion score of 7 and she can invest in one of two portfolio allocations A or B, which meet her required return and risk (standard deviation) objectives. The allocations are as follows:

- Allocation A (Portfolio A) has an expected return of 8.5% and a standard deviation of 9%.
- Allocation B (Portfolio B) has an expected return of 8.8% and a standard deviation of 10%.

**Required:**

Determine the investor's utility in each portfolio allocation and advise the investor on which allocation to choose.

(4 marks)

(d) Explain the strengths and weaknesses of mean-variance optimisation as an asset allocation approach. (6 marks)

(Total: 20 marks)

#### QUESTION TWO

(a) Outline three advantages and three disadvantages of enhanced indexing by small risk factor mismatches as a bond portfolio strategy. (6 marks)

(b) Regardless of strategy employed, a bond portfolio manager should be judged against benchmark and the benchmark should match the characteristics of the portfolio.

Describe the following considerations when selecting a benchmark:

- (i) Market value risk. (2 marks)
- (ii) Credit risk. (2 marks)
- (iii) Income risk. (2 marks)
- (iv) Liability framework risk. (2 marks)

- (c) Paul Kite's portfolio consists of the bonds shown below:

Bond	Market value (Sh. '000')	Effective duration
I	370	4.5
II	420	6.0
III	210	7.8
Portfolio	1000	?

**Required:**

- (i) The effective duration of Paul Kite's portfolio. (2 marks)
- (ii) Interpret the significance of the above measure. (2 marks)
- (d) An investor has Uganda shillings (USh.) 100 million and would like to institute a contingent immunisation strategy over the next six years. Current rates of return for immunisation strategies are 100% but the investor is willing to accept an 8.5% rate of return. This active strategy is to purchase KSh.100 million in 8% coupon semi-annually compounded 25-year bonds priced to yield 10%.

**Required:**

Determine the investor's cushion spread.

(2 marks)

**(Total: 20 marks)**

**QUESTION THREE**

- (a) Alex Otuoma, a portfolio manager at Beta Capital, has Sh.40 million of funds to invest. He borrows an additional Sh.100 million at 4% per annum in the hope of magnifying the rate of return on the portfolio.

Assume that the manager can invest all the funds at a rate of 4.5% per annum.

**Required:**

- (i) The leveraged rate of return on the portfolio. (2 marks)
- (ii) The rate of return on each component of the portfolio. (2 marks)
- (b) Explain the following approaches to hedging the currency risk in an international bond investment:
- (i) The forward hedge. (3 marks)
- (ii) The proxy hedge. (3 marks)
- (iii) The cross hedge. (3 marks)
- (c) A portfolio manager is considering exchanging one bond issue for another that he believes is undervalued:

- The existing bond has a total market value of Sh.11 million with a price of Sh.160 and a duration of 8.
- The new bond has a duration of 10 and a price of Sh.180.

**Required:**

The par value of the new bond necessary to keep the duration of the portfolio constant.

(3 marks)

- (d) Two managers, Jerry and Tom, follow the stocks in a broad market index and have made independent forecasts. Jerry has made 400 independent forecasts and has an information co-efficient of 0.05. Tom has made 150 independent forecasts and has information co-efficient of 0.07.

**Required:**

- (i) Each manager's information ratio. (2 marks)
- (ii) The manager with the better performance. (2 marks)

**(Total: 20 marks)**

**QUESTION FOUR**

- (a) Evaluation of portfolio performance heavily relies on benchmarks. Explain any five characteristics which these benchmarks must possess for them to be relevant. (10 marks)
- (b) Weru has a 10-year bond in an actively managed portfolio. The bond has a market value of Sh.50 million and a duration of 4.7. The portfolio has a total value of Sh.200 million and a duration of 6.8. The basis point change is 100.

**Required:**

The percentage contribution of the bond's shilling duration to the portfolio's shilling duration. (4 marks)

- (c) A portfolio manager must be aware of the risks that relate to market interest rates and the structure of the bonds in the portfolio.

Describe the following types of risks:

- (i) Interest rate risk. (2 marks)
- (ii) Contingent claim risk. (2 marks)
- (iii) Cap risk. (2 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

- (a) With regard to international fixed income portfolio management, describe any three sources of excess return that a portfolio manager may use instead of passively overseeing the portfolio. (6 marks)
- (b) Monsura, an investor uses a core-satellite approach to allocate funds amongst equity managers. The equity managers' active risk, active return and allocations are shown as follows:

	Active risk	Active return	Allocation
Enhanced indexing	1.7%	2.5%	45%
Active Manager X	1.9%	3.00%	25%
Active Manager Y	3.3%	5.5%	10%
Active Manager Z	3.9%	7.2%	5%
Passive index	0.00%	0.000%	15%

Assume that the correlation between the managers' active returns is zero.

**Required:**

- (i) Describe the investor's core. (2 marks)
- (ii) Determine the investor's active return. (2 marks)
- (iii) Determine the investor's active risk. (2 marks)
- (iv) Determine the investor's information ratio. (2 marks)
- (c) Maryanne Ngeno plans to buy crude oil in one month to produce gasoline and heating oil for sale in two months. The 1-month futures price for crude oil is currently selling for Sh.18,000. The 2-month futures price for gasoline and heating oil per barrel are Sh.20,000 and Sh.23,000 respectively.

**Required:**

The 5-3-2 track (commodity) spread. (3 marks)

- (d) Kamongo foundation entered into a 2-year credit default swap on a notional principal of Sh.100,000,000 of a 5-year bond issued by the matrix corporation. The swap specifies an annual premium of 55 basis points and cash settlement.

Assume that the matrix corporation defaults at the end of the first year, and the bonds are trading at 60 cents to the shilling.

**Required:**

Describe the cash flows associated with the credit default swap. (3 marks)

**(Total: 20 marks)**

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THURSDAY: 28 May 2015.

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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) Evaluate the five major phases of portfolio management process. (10 marks)

(b) Peter Mutwiri is considering to invest in a share with a standard deviation of returns of 0.50 and a correlation coefficient with the market portfolio returns of 0.6. The risk-free rate is 5% and the standard deviation of the market portfolio returns is 0.25. The Sharpe ratio for the market portfolio is 0.40.

Required:

The expected return of the portfolio. (4 marks)

(c) A portfolio manager gathers the following economic data relating to country A's economic indicators:

Economic Indicator	5-year average	1-year average	Previous month	Current month
Unemployment rate	4.6%	5.3%	5.7%	6.0%
Retail sales	3.2%	2.5%	1.8%	1.0%

Required:

Explain the impact of the release of the current month data on the following investments:

(i) 5-year government bond. (3 marks)

(ii) Stock market index. (3 marks)

(Total: 20 marks)

**QUESTION TWO**

(a) Describe five strategies that could be used to overcome psychological biases in relation to behavioural finance. (5 marks)

(b) Allan and Susan, a couple that has been married for 45 years, have a portfolio composed of three asset classes which are spread between equity, bonds and cash. They have not undertaken portfolio rebalancing lately and they have approached you for professional advice.

The following table illustrates their asset allocation and return in relation to set benchmark for the first quarter of 2015:

Asset class	Actual weight (%)	Actual return (%)	Benchmark weight (%)	Benchmark return (%)
Equity	70	2.0	60	2.5
Bonds	20	1.0	30	1.2
Cash	10	0.5	10	0.5

Required:

(i) Using suitable computations, explain whether the couple has over-performed or under-performed the benchmark for the first quarter of 2015. (3 marks)

(ii) The couple's contribution of security selection to relative performance. (2 marks)

(iii) The couple's contribution from asset allocation. (2 marks)

(iv) Comment on the overall performance of the portfolio based on the results obtained in (c) (i) to (iii) above. (2 marks)

(c) Examine three factors that could be responsible for the recent surge in international portfolio investment. (3 marks)

(d) You are an investor based in the Eurozone and have just sold Microsoft shares which you bought six months ago. You had invested 10,000 Euros (€) to buy Microsoft shares at 120 United States dollars (\$) per share, when the exchange rate was \$1.15 per €. You bought the stock for \$135 per share and converted the dollar proceeds into euro at the exchange rate of \$ 1.06 per €.

Required:

(i) The return on your investment in Euros (€). (2 marks)

(ii) The profit or loss from this investment in Euros (€).

(1 mark)  
(Total: 20 marks)

**QUESTION THREE**

(a) In relation to equity portfolio management:

(i) Summarise three advantages of returns-based style analysis. (3 marks)

(ii) Describe three disadvantages of holdings-based style analysis. (3 marks)

(b) Explain the term "tactical asset allocation" as used in portfolio management. (2 marks)

(c) An investor holds two stocks, A and B. An analyst prepared ex-ante probability distribution for the possible economic scenarios, the conditional returns for the two stocks and the market index as shown in the table below:

Economic scenario	Probability	Conditional returns (%)		
		A	B	Market
Growth	0.40	25	20	18
Stagnation	0.30	10	15	13
Recession	0.30	-5	-8	-3

The risk free rate during the next year is expected to be 11%.

Required:

Using the alpha for each stock, advise the investor on whether to liquidate his holdings in stock A and stock B or make fresh investments in them. (12 marks)

(Total: 20 marks)

**QUESTION FOUR**

(a) Discuss three types of benchmarks that could be used in portfolio performance evaluation. (6 marks)

(b) Janet Akinyi is a portfolio manager in country L which has bid to be the host country for a major international sports tournament. The host country will be announced in three weeks time. Janet believes that the share price of Nimo Ltd., a hotel operating company, will be significantly influenced by the outcome of the bid to host the tournament. If country L is not selected, she believes that Nimo Ltd. share price would rise significantly. If country L is selected, she believes that Nimo Ltd.'s share price would fall significantly. Janet wants to profit from her beliefs by implementing a straddle. She gathers the information shown below:

**Nimo Ltd. share and option data:**

Current share price of Nimo Ltd.	Sh. 8.80
Annual risk free rate	1.50%
Price of one month call option with an exercise price of Sh.9.00	Sh.0.38
Price of one month put option with an exercise price of Sh.9.00	Sh.0.57

Required:

Determine each of the following:

(i) The profit per share on the straddle if country L wins the bid and Nimo Ltd. share price doubles. (2 marks)

(ii) The price of the two shares of Nimo Ltd. at which break-even for the straddle occurs. (2 marks)

(c) Using the information provided in (b) above, explain why each of the following option strategies is less appropriate than a straddle given Janet believes:

(i) Bull spread. (2 marks)

(ii) Short butterfly spread. (2 marks)

(iii) Zero cost collar. (2 marks)

(d) An investor has an investment budget of Sh.3 million and intends to borrow an additional Sh.1 million to invest in a risky asset. The risk free rate is 7%, the risk premium is 8% and the standard deviation is 22%.

Required:

The reward-to-volatility ratio of the leveraged portfolio. (4 marks)

(Total: 20 marks)

**QUESTION FIVE**

(a) (i) Explain the term "structured portfolio strategy" as used in portfolio management. (1 mark)

(ii) Analyse three types of structured portfolio strategies.

(6 marks)

(b) The following are two portfolios, A and B, both of which have a market value of Sh.500 million:

Portfolio A		
Bond	Maturity (Years)	Market value (Sh. "million")
1	2.9	120
2	3.3	130
3	10.4	95
4	10.1	155

Portfolio B		
Bond	Maturity (Years)	Market value (Sh. "million")
1	5.1	140
2	6	130
3	4.9	95
4	5.3	135

Assume that the above bonds are trading at par, and have the same portfolio duration.

Required:

(i) Giving reasons, identify the bullet portfolio and the barbell portfolio. (4 marks)

(ii) Explain whether the performance of the two portfolios would be the same if interest rates change. (2 marks)

(c) Polycarp and Anastasia Kamau, both 32 years old, met and married when they were university students. They each embarked on promising and highly demanding executive careers after leaving college. They are hoping to retire at age 55 to travel and otherwise enjoy the fruits of their hard work. Now well established at their companies, they also want to start a family and are expecting the birth of their first child in two months time. They hope that the child will follow their tracks and obtain a four-year private university education. The couple anticipate supporting their child through university.

Assume that the couple will each live to the age of 85 years.

Required:

(i) Compare and contrast the couple's investment time horizons prior to, and immediately subsequent to the birth of their first child. (3 marks)

(ii) Interpret the challenges the birth will present to their retirement objectives. (2 marks)

(iii) Discuss approaches to meeting the challenges identified in (c) (ii) above, including investing more aggressively. (2 marks)

(Total: 20 marks)

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**PORTFOLIO MANAGEMENT**

THURSDAY: 4 December 2014.

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) Evaluate the following primary portfolio rebalancing strategies:

- (i) Buy and hold strategy. (2 marks)
- (ii) Constant-mix strategy. (2 marks)
- (iii) Constant-proportion strategy. (2 marks)

(b) Allan Biko is reviewing the performance of his largest asset, XYZ mutual fund for the month of October 2014. He uses the following data to undertake the task:

	XYZ Fund	Market
Average return (%)	12	10
Beta	1.2	1.0
Standard deviation (%)	26	24

The risk-free rate is 4%.

Required:

- (i) The risk-adjusted performance for the fund and the market using Sharpe, Jensen (alpha), and Treynor performance measures. (6 marks)
- (ii) Explain whether XYZ mutual fund outperformed the market using the results obtained in (b) (i) above. (2 marks)
- (iii) Advise Allan Biko on the best risk-adjusted performance measure to use when evaluating the performance of his portfolio. (2 marks)

(c) Leifa Mohamed, a financial analyst at Beta Capital Investment firm is evaluating two funds; Mega Fund and Steady Fund.

Additional information:

1. The benchmark for both funds is the S & P 500 index.
2. The active factor risk for Mega Fund is 20 and that of Steady Fund is 5.
3. The active specific risk for Mega Fund is 30 and that of Steady Fund is 2.

Required:

Compare the two styles of portfolio management adopted by the two funds. (4 marks)

(Total: 20 marks)

**QUESTION TWO**

(a) Highlight two assumptions used to justify the extension of domestic capital asset pricing model (CAPM) to the international capital asset pricing model (ICAPM). (2 marks)

(b) Ann Kariuki has collected the following information on her three-asset portfolio invested in Paida Securities Exchange:

	Assets		
	C	S	G
Amount invested (Sh.)	40,000	25,000	35,000
Expected return (%)	11	25	30
Standard deviation (%)	15	20	25

Correlations between assets:

Asset C and asset S	0.30
Asset C and asset G	0.10
Asset S and asset G	0.50

Required:

- (i) The expected return of the portfolio. (2 marks)

(ii) The standard deviation of the portfolio. (4 marks)

(c) James and Elizabeth Ndile, a couple, both aged 45 years are meeting with their financial adviser, Michael Foss who is creating an investment policy statement for them. James sold his consulting business at year end and retired. Both will rely on their investment portfolio to meet future expenses in excess of James retirement income. Elizabeth is not employed.

Their financial details include:

Income:

James will receive retirement payments of Sh.250,000 per year for his lifetime from the business he sold. The retirement payments are not indexed for future inflation and are fully taxable as ordinary income.

Expenses:

The couple's total living expenses for last year were Sh.450,000 and are expected to grow each year at the inflation rate. The couple does not expect any other significant cash outflows in the future. The tax rate on ordinary income and all investment returns is 30%. The inflation is expected to be 5% per year.

Assets:

The couple owns a mortgage-free home valued at Sh.6 million. They have a taxable investment portfolio with a current market value of Sh.8 million. This portfolio has no previous tax liability due in the coming year. James received a lumpsum of Sh.10 million from the sale of his business. The net proceeds of the sale will be added to the couple's investment portfolio. Their goals are to grow the asset base of the portfolio over time to maintain its after-tax purchasing power and to establish and maintain a cash reserve of Sh.500,000.

Required:

- (i) The nominal after-tax required rate of return for the coming year. (6 marks)
- (ii) Citing four reasons, describe the risk tolerance for the couple. (4 marks)
- (iii) Determine the couple's liquidity requirement for the coming year. (2 marks)

(Total: 20 marks)

**QUESTION THREE**

(a) Discuss three types of sub-styles of value investing style in relation to equity portfolio management. (6 marks)

(b) You work as an investment and securities analyst at Brenham Limited. The portfolio manager provides you with annual rates of return for a portfolio and the relevant benchmark index for the years 2009 to 2013:

Year	Portfolio Return (%)	Benchmark Return (%)
2009	12	14
2010	14	10
2011	20	12
2012	14	16
2013	16	13

Required:

- (i) The tracking error for the portfolio. (4 marks)
- (ii) Appraise three ways in which the tracking error obtained in (b) (i) above could have arisen. (6 marks)

(c) After reviewing historical quantitative data with respect to investing in emerging markets and venture capital, an investment consultant has recommended a substantial overweighting in both emerging market equities and venture capital.

Required:

Summarise four potential problems that might result from overweighting and are common to both emerging markets and venture capital. (4 marks)

**QUESTION FOUR**

(a) Explain the following terms in relation to behavioural finance:

- (i) Self control bias. (2 marks)
- (ii) Loss aversion bias. (2 marks)
- (iii) Framing bias. (2 marks)

(b) Apollo Investment Advisers (AIA) manages Sh.800 million portfolio composed of Sh.600 million worth of shares and Sh.200 million worth of bonds. In reaction to anticipated short term market events, AIA decides to adjust the allocation to 50% shares and 50% bonds through the use of futures. The position will be held only until "the right time to restore the original asset allocation". AIA determines that a financial futures-based asset allocation strategy is appropriate. The shares futures index multiplier is 250 and the denomination of the bond futures contract is Sh.100,000.

Additional information:

1. Bond portfolio modified duration 5 years
2. Bond portfolio yield to maturity 7%

3

3.	Basis point value of bond futures	Sh.97.85
4.	Share index futures price	Sh.1,378
5.	Share portfolio beta	1.0

**Required:**

- (i) Explain how Apollo Investment Advisers (AIA) should implement the financial futures-based asset allocation strategy. (4 marks)
- (ii) Determine the number of bond futures contracts needed to implement the AIA asset allocation strategy. (2 marks)
- (iii) Determine the number of shares index futures contracts needed to implement the AIA asset allocation strategy. (2 marks)
- (c) (i) Explain the term "money weighted rate of return". (2 marks)
- (ii) Martin Nyongesa bought 1,800 shares of OTC Limited on 1 January 2012 at a price of Sh.130 per share. A dividend of Sh.15 per share was paid on 1 January 2013. The dividend was not reinvested. On 1 January 2013, he sold 1,000 shares at a price of Sh.143 per share. On 1 January 2014, he received a dividend of Sh.18 per share (on 800 shares) and sold his remaining 800 shares at Sh.150 per share.

**Required:**

The time weighted rate of return on Martin Nyongesa's portfolio. (4 marks)  
(Total: 20 marks)

**QUESTION FIVE**

- (a) Explain the following terms in relation to active bond portfolio management strategies:
- (i) Barbell strategy. (2 marks)
- (ii) Bullet strategy. (2 marks)
- (iii) Laddered strategy. (2 marks)
- (b) Evaluate three common approaches used to implement the strategic asset allocation. (6 marks)
- (c) On 1 January 2014, John Kelly, an American, invested 1,000,000 United States dollars (USD) by buying shares in Tokyo Stock Exchange (TSE) at 20,000 Japanese yen (¥) per share.

**Additional information:**

1. The spot exchange rate on 1 January 2014 was (¥) 130/USD; and on 30 September 2014 was (¥) 125/USD.
2. The market price per share on 30 September 2014 was (¥) 25,000 per share.

**Required:**

- (i) The total return on the investment as at 30 September 2014. (4 marks)
- (ii) Comment on the relationship between the share price and foreign exchange rate based on (c) (i) above. (4 marks)

**PORTFOLIO MANAGEMENT**

(Total: 20 marks)

THURSDAY: 29 May 2014.

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) Evaluate the appropriateness of the following value at risk (VAR) methods in portfolio management:
- (i) Variance/covariance method. (2 marks)
- (ii) Historical method. (2 marks)
- (iii) Monte Carlo simulation method. (2 marks)
- (b) Examine three types of scenario analysis that an investment and securities analyst could use to supplement value at risk (VAR) in the risk management of a portfolio. (6 marks)
- (c) (i) Discuss two limitations of risk adjusted performance appraisal methods. (4 marks)
- (ii) The information below relates to portfolio A, portfolio B and the market portfolio:

	Portfolio A (%)	Portfolio B (%)	Market Portfolio (%)
Annualised return (R)	7.9	6.9	7.5
Annualised risk ( $\sigma$ )	5.5	3.2	4.5

The risk free rate is 2%.

**Required:**

The Modigliani risk-adjusted performance ( $M^2$ ) for portfolio A and portfolio B. (4 marks)  
(Total: 20 marks)

**QUESTION TWO**

- (a) As a portfolio manager at BKL Investment Bank, you intend to include commodity futures in your clients portfolio.

**Required:**

In relation to the above statement, outline five specifications that are likely to be found in a commodity futures contract. (5 marks)

- (b) Discuss the implications of the efficient market hypothesis for an investment policy as it applies to:
- (i) Technical analysis. (3 marks)
- (ii) Fundamental analysis. (3 marks)
- (c) The investment committee for a children's foundation in Uzuri Children's Home are guided by the following investment decisions:

- To keep any active factor risk, expressed as a standard deviation, at less than 5% per annum.
- To keep active specific risk at not more than 50% of active risk squared.
- To achieve an information ratio of 0.15 or more.

Gideon Mutuku, a portfolio manager for the foundation uses a risk model whose results are summarised below:

Factor incorporated in the risk model	Risk analysis data		
	Sensitivity		
	Portfolio	Benchmark	Factor Variance
Log of market capitalisation	0.05	0.25	225
E/P, the earnings yield	-0.05	0.05	144
B/P, the book to price ratio	-0.25	-0.02	100
Earnings growth	0.25	0.10	196
Dividend yield	0.01	0.00	169
D/A, the long-term debt to asset ratio	0.03	0.03	81
Volatility of return on equity (ROE)	-0.25	0.02	121
Volatility of earnings per share (EPS)	-0.10	0.03	64

- Active specific risk = -29.9406
- Active specific return = -0.5%
- Active return = 0.75%

The factor sensitivities in the model have the standard interpretation of factor sensitivities in fundamental factor models.

The active factor risk is given as:

$$\text{Active factor risk} = (\text{Sensitivity to the factor})^2 \times \text{factor variance}$$

**Required:**

Illustrate whether the above data is consistent with the objectives of the investment committee of the children's foundation. (9 marks)

(Total: 20 marks)

**QUESTION THREE**

- (a) Describe three approaches that could be used in constructing an indexed portfolio. (6 marks)
- (b) In relation to equity portfolio management:
- (i) Explain the term "style drift". (2 marks)
- (ii) Suggest two reasons that might cause the investors to be concerned about style drift. (4 marks)
- (c) James Oduor is a high networth client in your investment bank. He is considering adding corporate bonds to his current portfolio.



**Additional information:**

- The corporate bonds which James Oduor is considering adding to his portfolio have an expected return of 6.5%, an expected standard deviation of 10.5%, and a predicted correlation coefficient of 0.6 with his current portfolio.
- James Oduor's current portfolio has a Sharpe ratio of 0.46.
- The 182-day treasury bill is currently trading at 3.0%

**Required:**

As the investment bank's senior investment analyst, advise James Oduor on whether to include the corporate bonds in his current portfolio using the Sharpe ratio criterion. (3 marks)

- (d) Davis Kariuki is a Kenyan investor who is proposing to add Ugandan equities to his portfolio. The expected return on Ugandan equities is 14% with an expected standard deviation of 23.5% (both in local currency). The expected standard deviation of the Kenya Shilling/Uganda Shilling exchange rate is 6.0 % and the predicted correlation coefficient between Ugandan equity returns in local currency and exchange rate movements is 0.2.

**Required:**

The risk of Davis Kariuki's investment in Ugandan Equities measured in Kenya Shillings. (5 marks)  
(Total: 20 marks)

**QUESTION FOUR**

- (a) Summarise five assumptions of Markowitz portfolio theory in relation to an individual's investment behaviour. (5 marks)
- (b) Distinguish between "unique risk" and "market risk" as used in portfolio management. (4 marks)
- (c) Highlight four applications of the capital asset pricing model (CAPM). (4 marks)
- (d) Steve Ogada, a portfolio manager with KPMC Investment Bank manages a client's family investment portfolio. The portfolio initially consisted of Sh. 46 million of equities and Sh.32 million of bonds. As a result of a change in the client's family circumstances, the portfolio is rebalanced using the transactions shown below:

Transactions for rebalancing the portfolio			
Types of futures contracts	Action	Number of futures contract to buy/sell	Price per futures Contract (Sh.)
Equity futures contract	Buy	42	160,000
Bond futures contract	Sell	35	190,000

Three months after these transactions, the market value of the client's family portfolio's equities increased by 3.00% and the market value of its bonds decreased by 2.40%. The prices of the equity and bond futures contracts are currently valued at Sh.165,000 and Sh.185,250 respectively.

**Required:**

The profit or loss of the client's family investment portfolio over the past three months. (7 marks)  
(Total: 20 marks)

**QUESTION FIVE**

- (a) Discuss three types of risks that could be faced by emerging market debt (EMD) investors. (3 marks)
- (b) In relation to bond portfolio management, explain the following terms:  
(i) Contingent immunisation. (2 marks)  
(ii) Rate anticipation swap. (2 marks)
- (c) A securities and investment analyst is reviewing various asset alternatives. He is presented with the following information pertaining to the broad equity market in East Africa (E.A.) and various industries within the East African market that are of particular investment interest.

	Overall global investment market (GIM) portfolio	Industry	
		E.A. telecommunication	E.A. Consumer products
Expected risk premium	3.5	?	?
Expected standard deviation	8.5	12.0%	7.5%
Correlation with GIM portfolio	-	0.7	0.8

The East African market is assumed to be perfectly integrated with the world market.

**Required:**

The expected risk premium for the following:

- (i) East African telecommunication industry. (3 marks)
- (ii) East African consumer product industry. (2 marks)

- (d) Jeff Motors Pension Plan (JMPP) is the professional fund of a local motor company. JMPP is fully funded with Sh.800 million in assets and has the following investment policy objectives:

- Earn a 10.3% annual portfolio return.
- Have a maximum Roy's safety-first ratio with a minimum return threshold of 8%.
- Maintain a cash balance sufficient to meet liquidity requirements.
- Maintain a maximum of 10% of asset in a passively managed sub-portfolio that is indexed to a motor index of the local stock market, that is, stock market motor index (SMMI).

JMPP expects to pay Sh.32 million as pension benefit this year.

At an investment committee meeting, regarding possible changes to JMPP'S strategic allocation policy, the committee reviewed five alternative portfolio allocations to meet JMPP'S return objectives.

The alternatives were as follows:

Asset Class	JMPP Alternative Portfolio allocations (%)				
	A	B	C	D	E
Cash equivalents	3	5	6	5	6
SMMI	10	12	8	7	9
Bonds	40	40	47	45	41
Equities	47	43	39	43	44
Total	100	100	100	100	100

**Portfolio measures:**

Expected total annual return	11.26	11.19	10.44	10.60	10.87
Expected standard deviation	14.90	14.82	13.93	14.15	14.52

**Required:**

Recommend the most appropriate portfolio for JMPP. (8 marks)  
(Total: 20 marks)

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THURSDAY: 5 December 2013.

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) (i) Explain the term "portfolio performance attribution" as applied in portfolio management. (2 marks)
- (ii) In relation to an investment policy statement, describe four constraints that could limit a portfolio manager's decision when evaluating the investors' ability to take full or partial advantage of a particular investment. (8 marks)
- (b) As a Portfolio Manager of Investment Solutions Ltd., you have decided to divide the market into four portfolios following two dimensions; Value/Growth and Small/Large. The weight of each portfolio in the market is given. The risk free rate is 2%. You have further designed the following model:

Portfolios	Weight	Sensitivity to factor I (Market beta)	Sensitivity to factor II (Price/book)	Sensitivity to factor III (Average capitalisation)
Small value	5%	0.85	0.8	1
Small growth	5%	0.95	1.3	1
Large value	40%	0.90	2	8
Large growth	50%	1.1	3	10
Risk premium		8%	-2%	0.10%

Required:

- (i) Advise the company on which portfolio to select using the arbitrage pricing theory (APT). (4 marks)
- (ii) The expected return of the market using the arbitrage pricing theory. Comment on how the return on the market compares with the other four portfolios. (3 marks)
- (iii) The portfolio that would maximise your return if you decide to use capital asset pricing model (CAPM). (3 marks)
- (Total: 20 marks)

**QUESTION TWO**

- (a) The Managers of Mercury Life Insurance Company are considering hiring a consultant to advise them on portfolio immunisation. Different consultants were interviewed and they gave different presentations. The following five statements were extracted from the consultants' presentations:

- A great thing about immunisation is that it is a set-and-forget strategy. That is, once you have immunised your portfolio, there is no subsequent work to be done.
- The immunisation target rate of return is less than yield to maturity.
- If a portfolio is immunised against a change in the market yield at a given horizon by matching portfolio duration to horizon, the portfolio faces no risk except for default risk.
- The liquidity of securities used to construct an immunised portfolio is irrelevant.
- In general, the entire portfolio does not have to be turned over to rebalance an immunised portfolio. Furthermore, rebalancing need not be done on a daily basis.

Required:

Critique each of the above statements. (10 marks)

- (b) The following information relates to three portfolios; A, B and C of an equity composite during the year 2013:

	Cash flow weighting factor		Portfolio (Sh."million")		
	A	B	A	B	C
Market value as of July 31			74.9	127.6	110.4
External cash flows:					
August 8	0.742			-15	
August 12	0.613			-7.5	
August 19	0.387			-5	15
Market value as of August 31			85.3	109.8	128.4

Required:

- (i) The returns of portfolio A and portfolio B for August 2013 using the modified Dietz formula.

Dietz formula =  $EMV - BMV - CF$

$$BMV + \sum_{i=1}^n W_i \times CF_i$$

Where: EMV = Ending market value  
 BMV = Beginning market value  
 CF = Cash flow  
 W<sub>i</sub> = Weight to be applied on cash flow on day<sub>i</sub>  
 CF<sub>i</sub> = Cash flow on day<sub>i</sub>

(4 marks)

- (ii) The August 2013 composite return, weighting the individual portfolio returns using a method that reflects both beginning of period values and external cash flows. (6 marks)
- (Total: 20 marks)

**QUESTION THREE**

- (a) Discuss the following types of market anomalies:

- (i) Fundamental anomalies. (3 marks)
- (ii) Technical anomalies. (3 marks)
- (iii) Calendar anomalies. (3 marks)

- (b) In relation to international portfolio management, highlight five factors that have contributed to institutional investors treating currency or foreign exchange rate as a viable asset class. (5 marks)

- (c) Jomvu Ltd. has two subsidiaries which are responsible for managing investments for its clients and exporting milk products. Jomvu Ltd. decides to use interest rate swap to reduce risk on its fixed income investment portfolio of Sh 1.8 billion in bonds with a modified duration of 6 years. As the company is concerned about rising interest rates, it decides to reduce the bond portfolio modified duration to 3 years using interest rates. The swap has a modified duration of -2 years for the pay fixed side. Jomvu Ltd. also wants to borrow Sh.800 million for 5 years to fund its growth. The credit markets in the country have tightened and it would cost 17.70% per annum to borrow this amount locally, but the firm can obtain a Yen denominated loan at a fixed rate of 9.50% per annum. This would expose Jomvu Ltd. to substantial currency risk. A 5 year currency swap is available in which Jomvu Ltd. would pay interest in shillings to the counterparty at 12.20% and receive interest in Yen from the counterparty at 7.10% per annum. The current exchange rate is Sh80/Sh.

Required:

- (i) The notional principal required when Jomvu Ltd. enters into a pay fixed swap position to reduce the duration of the bond portfolio to the desired level. (3 marks)
- (ii) The net Yen interest expense for each year when Jomvu Ltd. enters into the Yen-Shilling currency swap for Sh.800 million. (3 marks)
- (Total: 20 marks)

**QUESTION FOUR**

- (a) As an investment consultant, your clients are the trustees of a large teachers pension fund that requires your input on a portfolio monitoring and revision.

Required:

- (i) Outline three reasons why portfolio revision is necessary. (3 marks)
- (ii) Discuss three areas which should be considered when implementing an investors' portfolio monitoring policy. (6 marks)

- (b) The returns on stock C and market portfolio for a period of six years are as follows:

Year	Return on stock C (%)	Return on market stock (%)
1	12	8
2	15	12
3	11	11
4	2	-4
5	10	9.5
6	-2	-2

Required:

- (i) The characteristic line for stock C. (5 marks)
- (ii) The systematic risk of stock C. (3 marks)
- (iii) The unsystematic risk of stock C. (3 marks)

(Total: 20 marks)

**QUESTION FIVE**

- (a) Majority of the emerging and developed countries are in the process of integrating their financial markets globally.

An integrated financial market in the world would achieve international efficiency, in the sense that capital flows across markets would instantaneously take advantage of any new information throughout the world.

Required:

In relation to the above statement, summarise five factors that could hinder international capital flows. (5 marks)

- (b) Distinguish between "stock based enhancing indexing" and "synthetic enhancing" in relation to equity portfolio management. (2 marks)
- (c) Bob Onyango, an investment adviser is counselling Angela Kibe, a client who recently inherited Sh.1,200,000 and has above-average risk tolerance ( $RA = 2$ ). Angela Kibe is young and one of her objectives is to fund a comfortable retirement, whereby she will earn returns that will outpace inflation in the long-term. However, Angela expects to liquidate Sh.60,000 of the portfolio in 12 months to make the down payment on a house. If that need arises, she has expressed her wish that it will be important for her to take out the Sh.60,000 without invading the initial capital of Sh.1,200,000.

The three alternative strategic asset allocations are shown below:

Asset allocation	Investor's forecasts	
	Expected return	Standard deviation of return
A	10%	20%
B	7%	10%
C	5.25%	5%

Required:

- (i) Based on Angela Kibe's risk adjusted expected returns, determine her preferred asset allocation. (5 marks)
- (ii) Given Angela Kibe's desire not to invade the Sh.1,200,000 principal, calculate the shortfall level,  $R_L$ . (2 marks)
- (iii) Advise Angela Kibe on the best asset allocation using Roy's safety criterion. (4 marks)
- (iv) Recommend a strategic asset allocation for Angela. (2 marks)

(Total: 20 marks)



FRIDAY: 7 June 2013.

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

**QUESTION ONE**

(a) Explain the following trading strategies as used in bond portfolio management:

- (i) Sector rotation trades. (3 marks)
- (ii) Credit adjustment trades. (3 marks)
- (iii) Yield curve adjustment trades. (3 marks)

(b) The following information relates to portfolio A's return and the bond index return:

Period	Portfolio A return (%)	Bond index return (%)
1	2.15	1.65
2	0.89	-0.10
3	1.15	0.52
4	-0.47	-0.60
5	1.71	0.65
6	0.10	0.33

$(y - \bar{x}) - 1 = 5$

Required:

- (i) The annualised tracking error in basis points. (6 marks)
- (ii) Summarise five characteristics of a benchmark used in evaluating portfolio performance. (5 marks)

(Total: 20 marks)

**QUESTION TWO**

(a) Discuss five obstacles to cross-border mergers, acquisitions and listings. (10 marks)

(b) Penda Ltd. has invested in 100,000 shares of Leila Ltd. The management of Penda Ltd. are concerned about the recent volatility in Leila Ltd.'s share price and wish to protect the company's investment from possible share price fluctuations for the next three months, but do not wish to sell the shares at present. No dividends will be paid by Leila Ltd. during the next three months.

The following market data has been provided:

Leila Ltd.'s current share price	Sh.2
Call option exercise price	Sh.2.2
Time to expiry	3 months
Interest rates (annual)	6%
Volatility of Leila Ltd.'s shares	50% (standard deviation per annum)

Option contracts are for purchase or sale of 1,000 units of shares.

Required:

- (i) Devise a delta hedge that is expected to protect the investment against changes in the share price for the next three months. (8 marks)
- (ii) Comment upon whether or not such a hedge is likely to be totally successful. (2 marks)

(Total: 20 marks)

**QUESTION THREE**

(a) George and Mary Kamau are a couple living in a rented apartment in the capital city of your country. George, aged thirty years, is an assistant manager at a telecommunication company and earns an annual salary of Sh.1,200,000 before taxes. Mary, aged twenty five years, stays at home to take care of their newborn twins. She has recently won Sh.1,000,000 from a local television station game show.

The couple have accumulated the following assets at current market value: Sh.500,000 in cash, Sh.1,600,000 in stocks and bonds and Sh.2,200,000 in the telecommunication company stock.

The couple needs Sh.3,000,000 as the final payment for the purchase of a house and plan to make a Sh.500,000 donation to a local charity. Their annual living expenses are Sh.900,000. After tax salary increases will offset any future increases in their living expenses. As they hold discussions with their family financial advisor, they express concern about achieving the education goals of their children and their own retirement goals. The couple intends to have sufficient funds to retire in twenty four years when their children complete their university education. They have been unhappy with the portfolio volatility they have experienced in the recent years. They state that, they do not want

to experience a loss in the portfolio value greater than 12% in any one year. The tax rate on salary is at 30%. You have determined that in twenty four years, the couple will need Sh.6 million to meet their education and retirement goals.

*To cater for inflation, not to lose more than 12% per year for education and retirement. To ensure it.*

Required:

- (i) Formulate the risk objectives for an investment policy statement for the couple. (4 marks)
- (ii) Formulate the return objectives for the investment policy statement of the couple. (2 marks)
- (iii) Calculate the pretax return that is required to achieve these objectives. (8 marks)

(b) Moses Weru compiles the necessary data to estimate the intrinsic value of his country's broad equity index. The current annual dividend for the index is Sh.2. The initial dividend growth rate is 6% and after twelve years, the dividend growth rate will decline linearly by a total of 40%. The discount rate to perpetuity is 5%.

Required:

Determine the country's broad equity index price level implied by the H-model. (6 marks)

(Total: 20 marks)

**QUESTION FOUR**

(a) Describe the following terms as used in arbitrage pricing:

- (i) Index arbitrage. (2 marks)
- (ii) Program trading. (2 marks)
- (iii) Expiration day-effect. (2 marks)

(b) Edison Ben is considering to invest in a 6%, 25 year bond selling to yield 9%. The modified duration for this bond is 10.62 and the convexity is 182.92. The required yield is expected to increase by 200 basis points from 9% to 11%.

Required:

The percentage change in price of the bond. (6 marks)

(c) The policy committee of Usiku Investment Ltd. used reports from various security analysts to develop inputs for the single-index model. Output derived from the single-index model consisted of the following efficient portfolios:

Portfolio	Expected return (%)	Standard deviation (%)
1	8	3
2	10	6
3	13	8
4	17	13
5	20	18

Required:

- (i) The optimal portfolio at a risk free rate of 6%. (6 marks)
- (ii) The expected portfolio return at a standard deviation of 12%. (2 marks)

(Total: 20 marks)

**QUESTION FIVE**

(a) Explain the following terms as used in behavioural finance:

- (i) Anchoring trap. (2 marks)
- (ii) Cognitive dissonance. (2 marks)
- (iii) Hindsight bias. (2 marks)
- (iv) Social proof. (2 marks)

(b) Besty Ltd. has provided the following information about a portfolio:

Expected market return	15%
Risk free rate of return	9%
Standard deviation of an asset	2.4%
Market standard deviation	2.0%
Correlation coefficient of the portfolio with market	0.9

Required:

The expected rate of return of the portfolio. (4 marks)

(c) In relation to equity portfolio management, discuss the following:

- (i) Two types of style analysis. (4 marks)
- (ii) Two types of enhanced indexing strategies. (4 marks)

(Total: 20 marks)

PORTFOLIO MANAGEMENT

THURSDAY: 6 December 2012.

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) Highlight four limitations of the sharpe ratio as a portfolio performance measure. (4 marks)

(b) An investor has Sh.1 million to invest and would like to achieve a 17% rate of return on a portfolio consisting of a risk free asset and the market portfolio of risky assets. The risk free rate is 5% and the expected return on the market portfolio of risky assets is 13%.

Required:

The amount the investor would need to borrow at the risk free rate in order to achieve the 17% target expected return. (4 marks)

(c) Highlight six circumstances when the asset liability management (ALM) approach would be preferred over the asset only (AO) approach in strategic asset allocation. (6 marks)

(d) Richlands Asset Managers (RAM) manages an equity portfolio for Diamond Manufacturing Ltd. RAM invest in a small number of sectors within a broad equity universe. The investment objective of RAM is to outperform a custom benchmark determined by Diamond Manufacturing Ltd.'s investment committee. The investment results for Diamond Manufacturing Ltd. equity portfolio for the quarter ended 30 September 2012 is presented below:

Industry	Weight (%)		Return (%)	
	Portfolio	Custom benchmark	Portfolio	Custom benchmark
Banking	20.30	21.90	4.55	4.90
Energy and Petroleum	31.00	34.30	3.60	3.10
Manufacturing and Allied	21.20	20.90	3.90	3.30
Telecommunication and Technology	21.50	22.40	1.50	0.20
Total Portfolio	100.00	100.00	3.42	2.80

Required:

(i) The pure sector allocation return for the banking sector of the portfolio for the quarter ended 30 September 2012. (3 marks)

(ii) The "within sector" allocation (security selection) return for the Telecommunication and Technology sector of the portfolio for the quarter ended 30 September 2012. (3 marks)

(Total: 20 marks)

QUESTION TWO

(a) Explain four factors that have contributed to low investment returns and portfolio choice in emerging markets. (4 marks)

(b) FCA Managers (FCAM) manages a portfolio of Sh.10 million, allocated as follows: (4 marks)

70% shares with a beta of 1.05 and 30% bonds with a modified duration of 5.5. As a tactical strategy, FCAM would like to temporarily adjust the portfolio allocation to 60% stock and 40% bonds and change the beta on the stock position from 1.05 to 1.00 and the modified duration from 5.5 to 5.0. FCAM is willing to use a stock index futures contract, which is priced at Sh.280,000 and has a beta of 0.98 and a bond futures contract which is priced at Sh.125,000 and has an implied modified duration of 6.50.

At the horizon date, the stock portfolio has fallen by 3% and the bonds have risen by 1%. The stock index future price is Sh.272,160 and the bond futures price is Sh.126,500.

Required:

(i) The number of share index futures contracts. (3 marks)

(ii) The number of bond index futures contracts. (3 marks)

(iii) Determine if FCAM should go long or short based on calculations in (b) (i) and (b) (ii) above. (4 marks)

(iv) The market value of the portfolio in which the allocation is adjusted using futures. (6 marks)

(Total: 20 marks)

QUESTION THREE

(a) Describe the following value and growth substyles as used in actively managed equity portfolios:

(i) High yield growth substyle. (2 marks)

(ii) Consistent growth substyle. (2 marks)

(iii) Earnings momentum substyle. (2 marks)

(b) A client has asked you, as his investment manager, to match the absolute price sensitivity of government bond portfolio to the absolute price sensitivity of its liability benchmark. Due to the nature of liabilities, the duration of the liability benchmark remains constant. At the beginning of the year 2012, the bond portfolio absolute price sensitivity was equal to the absolute price sensitivity of the liability benchmark. At the end of the year 2012, the investment manager will be required to rebalance the portfolio so that the absolute price sensitivity of the assets again matches the absolute price sensitivity of the liability benchmark, while keeping the portfolio proportions of each bond unchanged. The data required for rebalancing the portfolio is provided below:

Bond portfolio	Beginning of year 2012		End of year 2012	
	Price	Duration	Price	Duration
1	94.50	4.0	94.00	4.3
2	90.00	7.0	95.00	6.3
3	103.50	5.5	102.00	5.0

Additional information:

- Each bond has a total par value of Sh.1,000,000.
- Bond prices are shown as a percentage of the par value.

Required:

The amount of cash required for rebalancing the government bond portfolio. (8 marks)

(c) John Makeni manages Tanaka Global Fund which is a local based investment fund with a portfolio of 900 million United States Dollars (USD) invested in the United States of America and 700 million Euro invested in Europe. On 17 July 2012, John Makeni decided to fully hedge the fund's currency risk for the next two months. Tanaka Global Fund's home currency is the Kenya Shilling (Ksh.).

The following data was provided as at 1 July 2012:

Spot rate (Ksh/USD)	65.50
Spot rate (Ksh/Euro)	98.25
September dollar futures contract (Size = USD 100,000) (Ksh/USD)	70.00
September Euro futures contract (Size = Euro 100,000) (Ksh/Euro)	100.00

Required:

(i) Analyse the futures position that Tanaka Global Fund should take on 1 July 2012 to hedge the fund's currency risk. (4 marks)

(ii) The number of Dollar and Euro contracts needed to hedge the exchange rate risk. (2 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Discuss four major elements of an investment policy statement in the context of portfolio management. (8 marks)

(b) Execution costs can reduce the expected return and diversification benefits of an active global investment strategy.

Required:

With reference to the above statement, analyse three components of execution costs. (3 marks)

(c) After a lengthy career as a Consultant, Christine Rotich recently retired in the age of 70 years and is looking forward to spending retirement with her husband, Joseph Rotich. Although both Christine and Joseph Rotich are now retired, they would prefer to maintain their present life style which currently requires an annual spending of Sh.300,000 in real terms. Inflation is expected to be 3 per cent and the nominal risk free rate is 9.2 per cent.

The couple's survival probabilities for the next five years based on their current ages are listed in the table below:

Year	Christine Rotich		Joseph Rotich	
	Age	Probability (survival)	Age	Probability (survival)
1	71	0.9660	76	0.8235
2	72	0.9371	77	0.7996
3	73	0.9152	78	0.7727
4	74	0.8883	79	0.7408
5	75	0.8544	80	0.6919

Required:  
The capitalised value of the couple's core capital spending needs over the next five years. (9 marks)  
(Total: 20 marks)

QUESTION FIVE

- (a) (i) Explain five consequences of loss aversion bias among financial market participants. (5 marks)  
(ii) Describe three strategies which could be used to mitigate illusion of control bias among investors. (3 marks)
- (b) A portfolio manager uses the multifactor model shown in the table below:

Risk factor	Portfolio A Factor sensitivity	Portfolio B Factor sensitivity	Benchmark Factor sensitivity
Confidence risk	0.27	0.27	0.27
Time horizon risk	0.56	0.56	0.56
Inflation risk	-0.12	-0.45	-0.37
Business cycle risk	2.25	1.00	1.71
Market timing risk	1.00	1.00	1.00

- Required:
- (i) Calculate the weights the manager would put on portfolios A and B to achieve zero excess business cycle factor sensitivity. (3 marks)
- (ii) Compute the inflation factor sensitivity of the resulting portfolio. (2 marks)
- (c) Highlight two major implications of the capital asset pricing model (CAPM) on a market portfolio. (2 marks)
- (d) The expected return on an investor's tangency portfolio is 14 per cent with a standard deviation of 24 per cent. The risk free rate is 6 per cent.

- Required:
- (i) The investor's risk premium per unit risk. (2 marks)
- (ii) The portfolio expected return if the portfolio's standard deviation of return is 20 per cent. (3 marks)  
(Total: 20 marks)

PORTFOLIO MANAGEMENT

CSIA PART III SECTION 6

THURSDAY: 31 May 2012.

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) (i) Discuss three major functions of an investment policy statement (IPS) in the portfolio management process. (6 marks)
- (ii) Richard Kweli has developed an investment policy statement (IPS) for Uwezo Foundation (UF), a charitable organisation whose stated goal is to enrich the lives of disadvantaged children in the society. The risk tolerance and return requirements for Uwezo Foundation are as summarised below:
- Risk tolerance  
Above average (maximum 15% annual standard deviation of returns).
  - Return requirement  
To earn an average annual return to meet a spending rate of 7.5% (including expected inflation) and management and administration fees of 0.6%.

To assist the foundation assess the appropriate strategic asset allocation for Uwezo Foundation portfolio, Richard Kweli has prepared the corner portfolios in the table below based on his capital market expectations.

A risk-free portfolio is available and is expected to return 4%. The directors of Uwezo Foundation consider the Sharpe ratio to be a dominant factor in asset allocation decisions.

Corner portfolios

Corner portfolio	Portfolio weights					Expected return (%)	Expected standard deviation (%)	Sharpe ratio
	Domestic Equities (%)	Non-domestic Equities (%)	Domestic intermediate term bonds (%)	Domestic long-term bonds (%)	Domestic real estate (%)			
1	100.0	0.0	0.0	0.0	0.0	8.9	18.0	0.272
2	76.2	23.8	0.0	0.0	0.0	8.7	16.8	0.280
3	64.6	24.0	0.0	0.0	11.4	8.5	16.0	0.281
4	55.6	22.6	0.0	9.5	12.3	8.2	14.9	0.282
5	53.2	24.7	13.3	0.0	8.8	8.0	14.1	0.284
6	32.6	26.2	41.2	0.0	0.0	7.1	11.0	0.282
7	0.0	24.8	75.2	0.0	0.0	5.7	7.7	0.221
8	0.0	15.5	84.5	0.0	0.0	5.5	7.5	0.220

Required:

- The strategic asset allocation that is most appropriate for Uwezo Foundation using mean variance analysis.
- (b) Mary Gina, a portfolio manager at BMC Consulting Limited is about to adjust her equity portfolio. Of interest to her is an upcoming initial public offering (IPO) for Alpha Ltd. and a review of ABC Ltd. To analyse the initial public offering, Mary Gina uses data from peer companies with business lines similar to Alpha Ltd. and combines them into an equally weighted portfolio to approximate the anticipated behaviour of Alpha Ltd's stock once it becomes publicly traded. Some of this information is presented below.

Alpha Ltd. peer firms monthly data  
December 2006 to December 2011 (Returns measured as decimal)

	Alpha Ltd. proxy portfolio	Market
Average monthly return	0.0051	0.0025
Variance of returns	0.0033	0.0021
Covariance with market return	0.0015	0.0021
Correlation with market return	0.5697	1.000

The current 182-day Treasury bill rate is 5%. The economist of BMC Consulting Limited anticipates a market risk premium of 8% on stock market investments.

While reviewing ABC Ltd. to decide whether it should be retained or removed from the equity portfolio, Mary Gina notes that ABC Ltd. has a beta of 1.2 and a forecasted return of 12%.

Required:

- (i) The estimated beta for Alpha Ltd. (3 marks)
- (ii) Advise Mary Gina on whether to invest in ABC Ltd. (3 marks)  
(Total: 20 marks)

QUESTION TWO

- (a) Describe three main inputs to the macro attribution approach in evaluating portfolio performance. (6 marks)
- (b) Assess three factors that could introduce potential bias in the measurement of portfolio risk and performance. (6 marks)
- (c) The average variance of return of all stocks in a portfolio is 625 and the correlation between the returns of any two stocks is 0.3.

Required:

- (i) The variance of return of an equally weighted portfolio of 24 stocks. (4 marks)
- (ii) The variance computed in (c) (i) above as a percentage of the portfolio variance achievable given an unlimited number of stocks. (4 marks)  
(Total: 20 marks)

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**QUESTION THREE**

- (a) Explain four types of active bond portfolio management strategies. *Interest rate, Bond swap, Yield curve* (3 marks)
- (b) If world markets are segmented, then impediments to the flow of capital prevent investors from taking advantage of relative mispricing between countries. In this case, the price of similar securities will not be equivalent in all markets, and superior performance by some investors may be possible.

**Required:**

With reference to the above statement, examine four potential impediments to the international flow of capital. (4 marks)

- (c) You are provided with the following information about two portfolios, A and B:

	Portfolio A	Portfolio B
Average excess returns (%)	15.24	8.52
Standard deviation (%)	22.38	22.35
Beta	1.05	0.95
Alpha (%)	3.52	-1.20
Residual standard deviation (%)	15.73	28.16

The risk-free rate is 3% and the benchmark standard deviation is 10%.

**Required:**

For each portfolio, calculate the following measures of performance:

- (i) Sharpe measure. (2 marks)
- (ii) Treynor measure. (2 marks)
- (iii) Appraisal ratio. (2 marks)
- (iv) Modigliani-squared ( $M^2$ ). (2 marks)
- (Total: 20 marks)**

**QUESTION FOUR**

- (a) Explain three assumptions sufficient to guarantee that the market portfolio is an efficient portfolio. (3 marks)
- (b) Alusa Aringo, a financial analyst, has forecasted the correlation coefficient between the rate of return on Knowlode Mutual Fund and the market portfolio at 0.8. He forecasts the standard deviations of the rates of return to be 0.25 for Knowlode Mutual Fund and 0.20 for the market portfolio.

**Required:**

Advise how Knowlode Mutual Fund and the risk-free security should be combined to obtain a portfolio with a beta of 1.6. (6 marks)

- (c) Outline seven steps followed when formulating the portfolio management process. (7 marks)
- (d) A two person fund management company has a portfolio with a market value of Sh.30 million. The firm's investment policy statement specifies a floor value of Sh.20 million and a multiplier of 2. (3 marks)

**Required:**

- (i) The desired equity position under constant proportion portfolio insurance (CPPI) strategy. (3 marks)
- (ii) The resulting asset mix. (1 mark)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) In practice, it is important to consider several characteristics of the individual bonds that are used to construct an immunised portfolio.

Explain three bond characteristics that must be considered when immunising a bond portfolio. (6 marks)

- (b) Magenzi Ltd. bonds have a face value of Sh.1,000, 8% coupon rate and four years to maturity.

The yield to maturity (YTM) is 10%.

**Required:**

- (i) Macaulay's duration. (6 marks)
- (ii) Modified duration. (2 marks)
- (c) (i) Explain three areas where interest rate swaps are used in portfolio management. (3 marks)

- (ii) The personal investment portfolio of Benta Kamoga consists of bonds with a value of Sh.12 million and a modified duration of 5.50 years. Benta Kamoga is concerned with the rising interest rates and wishes to reduce the bond portfolio modified duration to 2 years using interest rate swap with a modified duration of 2.40 years for the pay-fixed side.

**Required:**

The notional principal of the pay-fixed swap position to be entered to reduce the portfolio modified duration to the desired level. (3 marks)

**(Total: 20 marks)**