



STRATHMORE BUSINESS SCHOOL
BACHELOR OF COMMERCE
END OF SEMESTER EXAMINATION
AMS 3101: PENSION FUND MANAGEMENT

Date: Monday, 25th July 2022

Time: 2 Hours

Instructions:

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

QUESTION 1 (Total 30marks)

- a. Distinguish between a defined benefit plan and a defined contribution scheme
[4marks]

- b. Assume you are the owner of a business with 50 employees, each of whom now receives compensation of shs.1.2million a year. You have signed a pension contract with the employees promising to pay a yearly individual pension benefit equal to 20% of the retiring employee's compensation during his last year of employment. This retirement benefit will be paid at year end during each year of the employee's retirement until the employee dies. A pension investment portfolio has been set up to help pay these future benefits. At present the portfolio has a market value of shs.7million. In order to calculate the expected benefit payments and required contributions a number of assumptions need to be made:
 - Salary growth- 7% per year
 - Mortality rate: post retirement-15 years after retirement
 - Termination rate- no one leaves employment until retirement in 30 years
 - Years to retirement- Everyone will retire in 30 years
 - Postretirement benefit increases: None
 - Investment returns- 15% per year after inflation
 - Funding method- Annual annuity sufficient to fully fund by retirement

Required:

- i. What is the desired portfolio value of the firm? [4 marks]
- ii. Is the current portfolio value sufficient to meet the needs of part a [2marks]
- iii. If the firm wishes to make year-end annuity contributions to its investment portfolio, what must the contribution be? [2marks]

- c. The Defined Contribution (DC) plan has become the retirement plan of choice for many businesses and individuals instead of the defined benefit plan. Discuss the pros and cons of the DC scheme to a pensioner [8marks]
- d. Simon is chief financial officer (CFO) of Umeme Connections, a rapidly growing highly profitable energy company based in Nairobi. The company has a defined contribution pension scheme for its employees. Because of Umeme's young workforce with an average age of 28years, Simon believes the pension plan has no liquidity needs and can thus invest aggressively to maximize returns. He also believes that low yielding short term investments such as Treasury bills and Fixed deposits, respectively, have no place in a portfolio with such a long time horizon. His strategy, which has produced excellent returns for the past two years, has been to invest the portfolio as follows:
- 50 percent in a concentrated pool (10 to 15 stocks) of Blue Chip companies in the Financial, Telecommunications and Manufacturing sector in Kenya and in the other EAC countries.
 - 40 percent in long term high yielding government bonds in Kenya which have a high return of 13% and above
 - 5 percent in a venture capital fund.
 - 5 percent in an international equity fund.

Simon assures you that these limits comply with RBA regulations. The contribution scheme is registered with KRA and thus its investment income is exempted from taxation

Required:

Simon has asked you to draft Umeme's investment policy statement which should include the following:

- i. Return requirements
- ii. Risk tolerance
- iii. Time horizon
- iv. Liquidity requirements
- v. Unique needs and circumstances [10 marks]

QUESTION TWO (Total 20 marks)

- a. An analyst wants to evaluate Portfolio X, consisting entirely of common stocks, using both the Treynor and Sharpe measures. The following table provides the average annual rate of return for Portfolio X, the market portfolio (NSE ALL share index) and 91 day T-bills during the past 8 years.

	Avg. Return	Std. Dev.	Beta
Portfolio X	10%	18%	0.6
NSE All share index	12%	13%	
T-bills	6%		

- i. Calculate both the Treynor and Sharpe measure for Portfolio X and the market. [4marks]
- ii. Did Portfolio X over perform or underperform based on each of the measures? [2marks]
- iii. Why do we find conflicting results using the two measures? [4marks]

- b. A different way to evaluate performance is to use time weighted and money weighted returns. Highlight two advantages of using the:
- i. The time weighted return [2marks]
 - ii. The money market return [2marks]

Assume that a fund manager purchases one share of stock for shs.42.50. Exactly one year later, the share is worth shs.44 and the company pays a dividend of shs.1.00 per share. This is followed by two more annual dividends of shs.1.5 and shs.2.75 in successive years. At the end of the second year the share price falls back to shs.42.50 and upon receiving the third dividend, the investor sells the share for shs50.

- c. Based on the information given calculate the annualized time weighted rate of return [6marks]

QUESTION THREE (Total 20 marks)

- a. Briefly describe the role of the following players in the pension industry:
- i. Actuary [3marks]
 - ii. Trustee [3marks]
 - iii. Custodian [3marks]
 - iv. Fund manager [3marks]
- b. The fund manager wishes to invest in one of the following money market securities
- 1. A 180 days commercial paper with a face value of shs.1million selling for shs.975,000
 - 2. A 182 days treasury bill selling for shs.980,000 with a par value of shs1million.
- The fund will hold the security purchased to maturity

Required:

- i. What is the yield to maturity of each security? [4marks]
- ii. Which security should the fund manager purchase? [1 mark]
- iii. Provide three reasons for selecting the security in (ii) above [3marks]

QUESTION FOUR (Total 20 marks)

Diamond Pension is a large pension fund with assets valued at over 10billion shillings. The fund administrator is concerned about the various risks that the fund faces and has provided you with the following information to help with the risk assessment:

Rental Income

The fund owns two high rise Grade A mixed used buildings. The first building is located in the Central Business District, has twenty two floors. The ground and the top floor are fully let to a restaurant and two coffee houses. The rest of the building is used as a private parking mainly leased to private companies on a monthly basis, however the 1 to 5th is available to the public for hire on a daily basis.

The second building is located in Westlands, has twenty floors of office space, fully let to both private and public companies. The building is very modern and uses green technology and is thus highly sought after by companies. All the tenants are on 3 year leases and pay rent on an annual basis and service

charge on a monthly basis. Both buildings are insured against the usual risks such as fire, theft floods and personal injury. However the administrator wants a thorough analysis of other operational risks as rental income from these two buildings account for 28% of the income of the fund.

- a. List four other operational risks that the buildings may face which can adversely affect the rental income of the fund. How can these risks be mitigated? [8marks]

Investment Income

One year ago the fund invested in a 30 year Kes 1 billion fixed income bond, the bond pays semi-annual coupons. The pension fund wishes to receive variable rate coupons and wants to swap its interest receivable with Green Ltd who desires to invest in a fixed income bond. The following information relating to the two companies have been provided:

	Fixed rate	Floating rate
Diamond Pension	13%	CBR
Green Ltd	14%	CBR

- b. Design a swap that will net a bank acting as intermediary 0.1 percent per annum and be equally attractive to both the companies. [6marks]
- c. Highlight the disadvantages and advantages to Diamond Pension of using a swap to hedge interest rate risk [6marks]

QUESTION FIVE (Total 20 marks)

The investment committee of Blue Fund wishes to diversify its portfolio holding to include private equity, offshore funds, and commercial real estate however the committee is concerned about risk exposure to the fund from these three asset classes.

- a. Advise the committee of the risks of investing in each of the three asset classes. [12 marks]

One method of measuring risk is to use Value at Risk (VAR). However this risk measure suffers from several drawbacks

- b. Discuss the advantages and disadvantages of using VAR to measure risk [8marks]