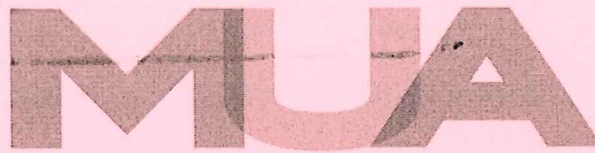


The
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UNDERGRADUATE UNIVERSITY EXAMINATIONS

SCHOOL OF MANAGEMENT AND LEADERSHIP

DEGREE OF BACHELOR OF COMMERCE

FIN 414: PORTFOLIO ANALYSIS MANAGEMENT

DATE: 8TH APRIL 2025

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.
7. Write all your answers in the Examination answer booklet provided.

QUESTION ONE

Read the Case Study below carefully and answer the questions that follow:

UTILITY MAXIMIZATION IN PORTFOLIO MANAGEMENT

Utility maximization in portfolio management refers to the process of selecting a portfolio that maximizes an investor's satisfaction or utility, based on their preferences for risk and return. This involves balancing the expected return against the level of risk the investor is willing to take. In this case, the investor's utility is modeled by a utility function, which penalizes risk (variance) and rewards higher expected returns. The investor seeks to find the portfolio allocation that offers the highest utility, reflecting their risk tolerance.

John, a risk-averse investor, is deciding how to allocate his wealth between two assets: a risk-free asset (like a government bond) and a risky asset (such as a stock index). The risk-free asset has a return of 3% per year, while the risky asset has an expected return of 8% per year with a standard deviation of 20%. John has a utility function that reflects his risk aversion and his goal is to maximize his utility based on his expected return and risk preferences.

John's utility function is given by:

$$U = E(R) - \frac{1}{2} A \sigma^2$$

Where:

- U is the investor's utility.
- $E(R)$ is the expected return on the portfolio.
- σ^2 is the variance (square of the standard deviation) of the portfolio's returns.
- A is John's coefficient of risk aversion. John's $A = 4$.

John needs to decide the optimal weight of his portfolio to invest in the risky asset and the risk-free asset in order to maximize his utility.

Required:

- a) With reference to the case study, examine how utility maximization principles guide the allocation of wealth between risky and risk-free assets based on investor preferences and changing market conditions (4 marks)
- b) Explain how the expected return and variance for a portfolio consisting of a risk-free asset and a risky asset is determined (5 marks)
- c) Explain how John can determine the optimal weight to invest in the risky asset to maximize his utility (5 marks)
- d) Determine the expected return and variance of John's optimal portfolio (5 marks)
- e) Suppose the risk-free rate increases to 5%, evaluate how will this impact John's optimal portfolio allocation (6 marks)

QUESTION TWO

- a) Prove that the value of a perpetual bond is simply the coupon divided by the investors required rate of return (9 marks)
- a) Examine six key services rendered by capital markets. (6 marks)

QUESTION THREE

- a) Examine the argument that the broad acceptance of market efficiency assumptions has led to suboptimal investment management practices (6 marks)
- b) Assess three reasons for utilizing the CAPM in portfolio analysis (6 marks)
- c) Distinguish between credit risk and reinvestment risk in bond investments (3 marks)

QUESTION FOUR

- a) A portfolio manager generated a rate of return of 15.5% on a portfolio with beta of 1.2. If the risk-free rate of return is 2.5% and the market return is 11.8%. Calculate the portfolio Jensen's alpha. (5 marks)

b) The following are the historical returns for the Anita Computer Company Ltd

| Portfolio | Anita Computer Ltd | General Index |
|-----------|--------------------|---------------|
| 1 | 37 | 15 |
| 2 | 9 | 13 |
| 3 | -11 | 14 |
| 4 | 8 | -9 |
| 5 | 11 | 12 |
| 6 | 4 | 9 |

Required:

- i). Compute the correlation coefficient between Anita Computer Company Ltd and the general index. (5 marks)
- ii). Compute the beta for the Anita Computer Company Ltd. (5 marks)

QUESTION FIVE

a) Determine the value of a plain vanilla bond with the following characteristics:

- A term to maturity of 6 years.
- An annual coupon rate of 4%.
- A face value of £100.
- A yield of 3%.

(6 marks)

b) The data below relates to Securities held by Mr. X

| No. of Shares "000" | Market Price per Share | Beta | Expected Return |
|------------------------|---------------------------|-------|-----------------|
| 120 | 64.35 | 1.044 | 17.55 |
| 160 | 43.8 | 1.152 | 21.6 |
| 200 | 32.55 | 0.81 | 15.75 |
| 250 | 47.10 | 1.35 | 20.70 |

Treasury bills rate of return is 9.9% while the required rate of return from alternative market securities is 17.1%.

Required:

Evaluate his portfolio as advocated for by Harry Markowitz in 1958 (9 marks)

QUESTION SIX

- a) Explore three methods the investment fund can utilize Arbitrage Pricing Theory (APT) for making portfolio decisions **(6 marks)**
- b) Discuss the importance of the assumption, fundamental to financial theory, that investors are 'risk averse'. **(4 marks)**
- c) Contrast strong-form market efficiency with weak-form market efficiency. **(5 marks)**

