Strathmore UNIVERSITY

STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES
BBS ACTUARIAL SCIENCE; FINANCIAL ECONOMICS; FINANCIAL ENGINEERING
SPECIAL EXAMINATION
BSF 2206 PORTFOLIO MANAGEMENT

DATE: 3rd April 2025 Time: 2 Hours

Instructions

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

QUESTION ONE [30 marks]

a) "Young people with little wealth should not invest money in risky assets such as the stock market, because they can't afford to lose what little money they have"

b) Explain the application of Macaulay duration in portfolio management (5 marks)

c) An investor has made the following return projections of each of three possible outcomes with an equal likelihood of occurrence:

Asset	Outcome 1 (%)	Outcome 2 (%)	Outcome 3 (%)	Expected return (%)
1	12	0	6	6
2	12	6	0	6
3	0	6	12	6

Required

i) Which pair of assets is perfectly negatively correlated? (4 marks)

ii) If the investor constructs two-asset portfolios that are equally weighted, which pair of assets has the lowest expected standard deviation? (4 marks)

iii) If the investor constructs two-asset portfolios that are equally weighted, which pair of assets provides the least amount of risk reduction? (4 marks)

d) Consider a 6% coupon Treasury bond with 1.5 years to maturity. Spot rates (expressed as yields to maturity) are: 6 months = 5%, 1 year = 6%, and 1.5 years = 7%. All rates are annual.

Required

Calculate the value of the bond today using forward rates. (10 marks)

QUESTION TWO [20 marks]

Consider the following relating to two assets:

Probability	Returns	
	NIDO	MALI
0.2	20%	-5%
0.3	-10%	10%
0.5	30%	15%

Required

Determine the portfolio weights of NIDO and MALI that will result in the lowest risk

QUESTION THREE [20 marks]

Consider the following information:

Return and Risk for Selected Investments			
Investment	***Expected Return***	***Standard Deviation***	***Beta***
Portfolio A	12%	30%	1.2
Portfolio B	15%	35%	0.8
Portfolio C	11%	40%	0.4
NSE Index	12%	22%	
Treasury Bills	3%	0%	

Required:

i) Evaluate performance of the three portfolios using Sharpe ratio and Treynor ratio (10 marks)

ii) Which performance measurement is appropriate for an investor holding undiversified portfolio? Explain. (2 marks)

iii) What are the shortcomings of Sharpe ratio? Explain how other performance measurements overcome those shortcomings. (3 marks)

iv) Assuming that the NSE index is the market portfolio. Calculate the market price of risk. (5 marks)

QUESTION FOUR [20 marks]

An investor performs the following transactions on the shares of a firm

- At t=0, she purchases a share for Sh. 1,000
- At t=1, she received a dividend of Sh. 25 and then purchases three additional shares for Sh. 1,055 each
- At t=2, she receives a total dividend of Sh. 100 and then sells the four shares for Sh. 1,100 each

Required

a) Arithmetic mean return (4 marks)

b) Geometric mean return (5 marks)

c) The money-weighted rate of return (11 marks)

QUESTION FIVE [20 marks]

a) An investor is considering investing in certain portfolios of assets and would like some help in portfolio selection.

Required

(i) Should they choose portfolios on the CAL or on the efficient frontier. Explain clearly. (6 marks)

(ii) How should the investor determine the optimal portfolio? (4 marks)

b) Explain any five constraints in portfolio construction for an individual investor. (10 marks)