Strathmore UNIVERSITY

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

DATE: 14th December 2022 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) Explain how an investor can invest passively in stocks and bonds. Provide example. (4 marks)

b) A friend is considering investing in bonds. Explain to him three important things for him to note before investing. Give relevant examples. (9 marks)

c) Consider the following:
- Mary is 30 years old with a 2-year-old child
- She works in a leading telecoms company. Her salary is enough to take care of her living expenses.
- She has received Sh. 1 million from her parents and would like to invest all of it. She neither plans to save any additional amounts nor withdraw any amounts until retirement.
- Mary expects to retire in 25 years' time. Upon retirement she expects to live for another 20 years spending Sh. 3 million every year. Mary hopes to bequeath her child Sh. 20 million upon her death.
- No taxes.
- Her knowledge of the financial market is scanty. She is also afraid of losing all her money in investments.
- She is an active member of a local lobby group advocating for clean renewable energy in the country.
- She approaches you for investment advice

Required
Prepare an Investment Policy Statement (IPS) for Mary outlining the following:
i) Risk objectives (5 marks)
ii) Return objective (include the target return). (7 marks)

iii) Constraints (5 marks)

QUESTION TWO [20 marks]

a) Explain the application of derivatives in investments and portfolio management citing relevant examples. (6 marks)

b) A corporate bond with a 4.25% coupon is priced at USD 104.03. This bond's duration is 5.3 What would be the impact on the bondholder's return if the bond's credit spread widens by 75 basis points due to a credit rating downgrade? (4 marks)

c) Consider the following information:

Investment	E(Ri)	σi
1	18%	2%
2	19%	8%
3	20%	15%
4	18%	30%

(i) Which investment will a risk averse investor with risk aversion coefficient 2 and utility function $U=E(R) - 0.5A\sigma^2$ choose? (5 marks)

(ii) What of a risk neutral investor? (1 mark)

d) An investor assumes that he can borrow money at 8% and achieve the same return on a stock index The index has an expected return of 20% with a standard deviation of 30%. Calculate his expected risk and return if he borrows 40% of his initial investment amount. (4 marks)

QUESTION THREE [20 marks]

a) An investor is considering equity investments in the retail sector in Kenya specifically supermarkets and she has asked you to carry out top-down equity analysis. Provide an outline of what should be included in the report (12 marks)

b) 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
The money-weighted rate of return (8 marks)

QUESTION FOUR [20 marks]

a) Explain the two components of interest rate risk. How do they relate to investor's investment horizon? (5 marks)

b) You have been given the following data which refers to the performance of the Dar es Salaam DSE - share index and the two companies over two financial years

DSE share index at the end of 2020	3116.21
DSE share index at the end of 2021	3711.94
Dividend yield on the market for 2021	4.55%
Current redemption yield for Treasury bills	3.78%

	Mwanza Ltd (shs)	**Moshi Ltd (shs)**
Share price at 31st December 2020	201	260
Share price at 31st December 2021	224	307
Dividend for one year	8	9
Equity beta	1.30	0.87

Using the data above, determine whether a diversified investor with shareholdings in the two companies will be satisfied with the returns they are receiving. (15 marks)

QUESTION FIVE [20 marks]

You are evaluating various investment opportunities currently available, and you have calculated expected returns and standard deviations for five different well-diversified portfolios of risky assets

Portfolio	**Expected return**	**Standard deviation**
A	7.8%	10.5%
B	10.0%	14.0%
C	4.6%	5.0%
D	11.7%	18.5%
E	6.2%	7.5%

a) For each portfolio, calculate the risk premium per unit of risk that you expect to receive. Assume that the risk-free rate is 3%. (5 marks)

b) Using your computations in part (a), explain which of these five portfolios is most likely to be the market portfolio. Draw the Capital Market Line (CML). (6 marks)

c) Having identified the market portfolio. If you are only willing to make an investment with $\sigma = 7\%$, is it possible for you to earn a return of 7% (4 marks)

d) What is the minimum level of risk that would be necessary for an investment to earn 7%? What is the composition of the portfolio along the CML that will generate that expected return? (5 marks)