FINM3093 Investments
Quiz

Name: _____ Student ID: _____

Date: 5 November 2024
Time allowed: 60 minutes **Full mark: 50**

1. (10 points)
   a. (5 points) You purchased 1,000 shares of common stock on margin at $19 per share. Assume the initial margin is 50%, and the maintenance margin is 30%. Below what stock price level would you get a margin call? Assume the stock pays no dividend; ignore interest on margin.
   b. (5 points) You purchased 100 shares of common stock on margin for $60 per share. The initial margin is 60%, and the stock pays no dividend. What would your rate of return be if you sell the stock at $72 per share? Ignore interest on margin.

2. (3 points)
   The Closed Fund is a closed-end investment company with a portfolio currently worth $200 million. It has liabilities of $3 million and 5 million shares outstanding. What is the NAV of the fund?

3. (12 points)
   Suppose we observe the data for stock returns as 0.1, -0.1, 0.2, 0.4, -0.4. The risk-free rate is 0.05. Calculate sample mean, unbiased sample variance, unbiased sample standard deviation and the Sharpe ratio of the stock returns.

4. (25 points)
   The universe of available securities includes two risky stock funds, *X* and *Y*, and T-bills. The data for the universe are as follows:

	Expected Return (%)	Standard Deviation (%)
X	10	20
Y	30	60
T-bills	5	0

The correlation coefficient between funds *X* and *Y* is –0.2.

   a. (8 points) Find the global minimum-variance portfolio and its expected return and standard deviation.
   b. (8 points) Find the optimal risky portfolio, *P*, and its expected return and standard deviation.
   c. (3 points) Find the slope of the CAL supported by T-bills and portfolio *P*.
   d. (6 points) How much will an investor with risk aversion coefficient $A = 3$ invest in funds *X* and *Y* and an in T-bills?

Appendix

- Minimum-variance portfolio

$$w_{Min}(D) = \frac{\sigma_E^2 - Cov(r_D, r_E)}{\sigma_D^2 + \sigma_E^2 - 2Cov(r_D, r_E)}$$

- Optimal risky portfolio

$$w_D = \frac{E(R_D)\sigma_E^2 - E(R_E)Cov(R_D, R_E)}{E(R_D)\sigma_E^2 + E(R_E)\sigma_D^2 - [E(R_D) + E(R_E)]Cov(R_D, R_E)},\ w_E = 1 - w_D$$

where *R* denotes the excess return.