考試科目 Course		系級		日　期 Date. Period	月 第	日 節	試題編號 Course No.	⟩

3-3

6. According to the capital asset pricing model, the only reason expected returns differ is:
   a. Variance.
   b. Beta.
   c. The market portfolio.
   d. The risk-free investment.

7. In theory, the capital asset pricing model requires that the market portfolio include:
   a. Common stocks.
   b. Bonds.
   c. Real estate.
   d. Human capital.
   e. All of the above.

8. The expected return on the market portfolio is 20%, and the risk-free rate of return is 8%. An investment has a beta of 1.4 and offers an expected return of 23%.
   a. This is a good investment because it earns more than the market rate of return.
   b. This investment has a negative net present value.
   c. This investment has a positive net present value.
   d. Need more information to decide if this is a good or bad investment.

9. The expected return on the market portfolio is 17%, and the risk-free rate of return is 9%. An investment has a beta of 1.8 and offers an expected return of 26%.
   a. This is a good investment because it earns more than the market rate of return.
   b. This investment has a negative net present value.
   c. This investment has a positive net present value.
   d. Need more information to decide if this is a good or bad investment.

10. Arbitrage pricing theory implies that there are higher risk premiums on stocks with returns that are especially sensitive to:
   a. Changes in long-term interest rates.
   b. Changes in short-term interest rates.
   c. The market portfolio.
   d. Oil price changes.
   e. None of the above.

（ 15% ）

【5】Let $Y_1, Y_2, \cdots, Y_n$ be observed and we know that $Y_i = \alpha + \beta x_i + \varepsilon_i$, $i = 1, 2, \cdots n$, where $x_1, x_2, \cdots, x_n$ are known constants and $\varepsilon_1, \varepsilon_2, \cdots, \varepsilon_n$ are independent random variables each with $N(0, \sigma^2)$. Find the MLE of α, β and σ^2.

（ 15% ）

【6】Let the observed sample $x_1, x_2, \cdots, x_n$ be taken from $N(\mu_X, \sigma_X^2)$ and the sample $y_1, y_2, \cdots, y_m$ from $N(\mu_y, \sigma_y^2)$. Given the data : $n = 25$, $\sum_i x_i = 845$, $\sum_i x_i^2 = 28678$, and $m = 29$, $\sum_i y_i = 918$, $\sum_i y_i^2 = 29231$. Test

（ a ）$H_0 : \dfrac{\sigma_X^2}{\sigma_Y^2} = 1$ against a two sided alternative with significance level 0.02.

（ b ）$H_0 : \mu_X = \mu_Y$ against $H_1 : \mu_X > \mu_y$ with significance level 0.01.

Note :

（ 1 ）$F_{0.01}(24, 28) = 2.52$, $F_{0.01}(28, 24) = 2.61$, where $\alpha = P[F > F_\alpha(m, n)]$.

（ 2 ）$z_{0.01} = 2.326$ where $\alpha = 1 - \Phi[z_\alpha]$

（ 15% ）

【7】Let the observations for X and Y are the following table :

X	9	10	13	15	18	13
Y	36	44	48	63	70	45

（ a ）Find the sample regression line of Y on X.

（ b ）Find the unbiased estimate of the variance.

一、(25%)

市場市目前出現二種蘋果，一種是好蘋果，一種是壞蘋果，消費者知道市場有這二類蘋果，但消費者卻無法由外表上區分何者是好蘋果，何者是壞蘋果，只有蘋果商知道如何區分。

假設蘋果商也知道消費者無法區分何者是好蘋果，何者是壞蘋果，所以市價相同。

(1) 就上述的給狀況，試分析蘋果的價格，銷售量，或其他的可能變化，並說明理由

(2) 當蘋果商將部份蘋果價格降低，但消費者不知是哪一類蘋果，試分析市場的反應。

二、(25%)

在1997~1998，利率逐漸下跌，但投資卻未見增加，報章上有各種解釋。

(1) 說明在學理上，貨幣政策如何透過利率，最後影響產出，再用您提出的學理，說明為何投資為何沒有增加。

(2) 同(1)，說明在學理上，貨幣政策如何透過銀行的行為(或銀行的其他)影響產出，再用您提出的學理解釋為何投資沒有增加

二. (50%)

1. Which of the following features increase(s) the value of a call option?
   a. A high interest rate.
   b. A long time to maturity.
   c. A highly variable stock price.
   d. All of the above.

2. Relative to the underlying stock, a call option always has:
   a. A higher beta and a higher standard deviation of return.
   b. A lower beta and a higher standard deviation of return.
   c. A higher beta and a lower standard deviation of return.
   d. A lower beta and a lower standard deviation of return.

3. The option delta is calculated as the ratio of:
   a. The spread of possible share prices to the spread of possible option prices.
   b. The share price to the option price.
   c. The spread of possible option prices to the spread of possible share prices.
   d. The option price to the share price.
   e. None of the above.

4. For European options, the value of a call minus the value of a put is equal to:
   a. The present value of the exercise price minus the value of a share.
   b. The present value of the exercise price plus the value of a share.
   c. The value of a share plus the present value of the exercise price.
   d. The value of a share minus the present value of the exercise price.

5. Suppose an investor buys one share of stock and a put option on the stock and simultaneously sells a call option on the stock with the same exercise price. What will be the value of his investment on the final exercise date?
   a. Above the exercise price if the stock price rises and below the exercise price if it falls.
   b. Equal to the exercise price regardless of the stock price.
   c. Equal to zero regardless of the stock price.
   d. Below the exercise price if the stock price rises and above if it falls.