UNIVERSITY OF JOHANNESBURG

FACULTY OF ECONOMIC AND FINANCIAL SCIENCES

DEPARTMENT OF ECONOMICS AND ECONOMETRICS

SUBJECT	FINANCIAL ECONOMICS A	**DATE**	14/06/2016
CAMPUS	APK	**TIME**	08:30 – 11:30 (3 Hours)
ASSESSMENT	FINAL EXAM	**MARKS**	65
EXAMINER	MR KPR MOREMA	**PAGES**	4
MODERATOR	PROF JMW MWAMBA (INTERNAL) MR JJ KOUADIO (INTERNAL) MR I MHLANGA (EXTERNAL)		

SURNAME AND INITIALS______________________________

STUDENT NUMBER ______________________________

CONTACT NUMBER ______________________________

EMAIL ADDRESS ______________________________

INSTRUCTIONS:

1. Use mark allocation as a guide to what is required.
2. Round final answers to four decimal places.
3. Answer all questions on the paper in pen.
4. Calculators are permitted.
5. Show all workings.
6. Label all graphs.
7. Write neatly.

1. Explain what it means for the economy to be in a competitive general asset market equilibrium. (4)

2. Given the following lotteries:

$$L_1 := \left(1, \frac{1}{10}; 1000, \frac{4}{10}; 2000, \frac{1}{5}; 3000, \frac{1}{20}; 4000, \frac{1}{20}; 5000, \frac{1}{5}\right)$$

$$L_2 := \left(2000, \frac{1}{10}; 2000, \frac{4}{10}; 2000, \frac{1}{5}; 2000, \frac{1}{20}; 2000, \frac{1}{20}; 2700, \frac{1}{5}\right)$$

   a. Draw the probability distributions of L_1 and L_2. [Hint: you need the mean and standard deviation]. Show all calculations. (4)
   b. What is the defining property of expected utility? (2)
   c. Given $u(W) = \ln(W)$, which lottery is preferred? (4)
   d. Discuss the absolute risk aversion implied by the utility in the previous question. (5)
   e. Determine the risk premium required to compensate the investor for taking the risk in the preferred lottery (determined in c.). (5)

3. Risk aversion: Suppose that you are an expected utility maximizer. Your current wealth is R 10 000 and your utility is given by:

$$u(W) = 2\sqrt{W}$$

   You are offered a gamble in which, with equal probability, you either win or lose R 2000. Calculate your certainty equivalent *and* risk premium for this gamble. (4)

4. Benefits to diversification:
   a. Consider a portfolio *P* consisting of proportion *x* of asset *A* and proportion *y* = 1 – *x* of asset *B*. Show mathematically that the variance of *P* (and, hence, the diversification benefits of holding *A* in combination with *B*) depends critically on the correlation between returns on *A* and *B*. (4)

   b. Provide an economic interpretation of the result derived in the previous question. (3)

5. Portfolio selection: "The mean-variance criterion (MVC) is a more general choice criterion than mean-variance dominance (MVD)".

   Is the above statement true? To motivate your answer, carefully explain how MVD and the MVC are used in portfolio selection. Provide examples to distinguish between the applicability of each approach. (6)

6. Equilibrium pricing: Let the subscripts: $j = 0$ denote the risk-free asset, $j = 1,...,n$ the set of available risky securities, and *M* the market portfolio. For the questions that follow, assume that CAPM provides an accurate description of reality.

   a. State the CAPM equation. (1)
   b. Use the CAPM equation to show that the following condition is true $s_j \le s_M$ for any *j*. What is the significance of this condition when interpreted in the context of the capital market line? (5)
   c. Assume that $\beta_j = 0.8, \mu_M = 0.1$ and $r_0 = 0.05$. Using the CAPM, determine the expected return from holding one unit of asset *j* for one period. (2)
   d. Given your answer to c.), what could you conclude (from the perspective of the security market line) if a market survey indicated that the forecasted one-period return on asset *j* was 8 percent? Describe and motivate the rational trading response that is consistent with your conclusion. (4)

7. Intertemporal choice: Suppose that a particular investor's utility is expressed as:

$$U(C_t, C_{t+1}) = u(C_t) + \delta E[u(C_{t+1})]$$

   Where $u(\cdot)$ is the felicity function, C_t denotes period *t* consumption, and δ is a subjective discount factor. We assume that the expected utility hypothesis (EUH) is satisfied.

   Current and future consumption are financed using initial wealth W_t. Specifically, to consume in period *t* + 1 the agents saves a portion S_t of initial wealth and invests this in optimal risky portfolio *P* with returns distribution $\tilde{r}_{P,t+1}$.

   a.) Use the given information to write out the investor's maximization problem. Hint: The economic agent's choice variable is S_t. (2)

   b.) Consequently, derive the agent's necessary (first order) condition (FOC) for achieving optimal levels of intertemporal consumption. (2)

c.) Provide an intuitive explanation of the FOC derived in the previous question. (2)

d.) Assume the following: $W_t = ZAR15{,}000$; $u(C) = \ln(C)$ in both periods; $\delta = 0.95$; the return of portfolio *P* is contingent on two equally states of nature, with:

State	Realized return r_{t+1}
1	25%
2	-5%

Determine the agent's optimal levels of savings S_t, first period consumption C_t, and expected second period consumption $E(C_{t+1})$. (6)

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