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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2017/2018 ACADEMIC YEAR FOUR**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BUSINESS AND ECONOMICS**

**FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT**

**COURSE CODE: BBM 413**

**COURSE TITLE: FINANCIAL ECONOMICS**

**EXAMINATION DURATION: 3 HOURS**

**DATE: 10/08/18 TIME: 2.00-5.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has SIX (6) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other THREE (3) questions from the remaining FIVE (5) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of FIVE (5) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Utility theory aims at incorporating the decision maker's preference explicitly into the decision procedure. In the light of this statement graphically demonstrate the three attitudes towards risk **[6 Marks]**
2. Mr. Nelson is trying to decide between the following three projects of varying risks as measured in terms of standard deviation.

Project internal rate of return standard deviation

A 20 8

B 15 5

C 30 20

The measurement of his performance is provided by the following linear equations:

W = a + b(y – 15)

W = 10 + 0.9 (y -15)

W is the compensation based on excess (shortage) of actual rate of return over minimum desired rate of return

a is the minimum compensation

b is the weighting of the difference between the actual rate and the minimum desired rate

y is the actual rate of return and 15% is the minimum desired rate of return

Mr. Nelson attitude towards risk could be described as: f = UW – 2δW

Where f is the utility value of each expected level of compensation, UW is the expected value of W and δW is the standard deviation of W and is measured by the expression b2δy

**Required**

1. Compute Mr. Nelson expected utility from each course of action  **[6 Marks]**
2. Explain and show the action that he should take **[4 Marks]**
3. Security returns depend on only three risk factors-inflation, industrial production and the aggregate degree of risk aversion. The risk free rate is 8%, the required rate of return on a portfolio with unit sensitivity to inflation and zero-sensitivity to other factors is 13.0%, the required rate of return on a portfolio with unit sensitivity to industrial production and zero sensitivity to inflation and other factors is 10% and the required return on a portfolio with unit sensitivity to the degree of risk

aversion and zero sensitivity to other factors is 6%. Security i has betas of 0.9 with the inflation portfolio, 1.2 with the industrial production and-0.7 with risk bearing portfolio—(risk aversion)

Assume also that required rate of return on the market is 15% and stock i has CAPM beta of 1.1

**Required:**

Compute security i's required rate of return using

1. CAPM **[2 Marks]**
2. APT **[2 Marks]**
3. Differentiate between first order and second order stochastic dominance **[2 Marks]**
4. Explain how short selling takes place **[3 Marks]**

**QUESTION TWO**

The risk free rate is 10% and the expected return on the market portfolio is 15%. The expected returns for 4 securities are listed below together with their expected betas

**SECURITY EXPECTED RETURN EXPECTED BETA**

A 17.0% 1.3

B 14.5% 0.8

C 15.5% 1.1

D 18.0% 1.7

**Required:**

1. On the basis of these expectations, which securities are overvalued? Which are undervalued **[9 Marks]**
2. If the risk-free rate were to rise to 12% and the expected return on the market portfolio rose to 16%, which securities would be overvalued? Which would be under-valued? (Assume the expected returns and the betas remain the same). **[6 Marks]**

**QUESTION THREE**

XYZ ltd. is considering three possible capital projects for next year. Each project has a 1 year life, and project returns depend on next year’s state of the economy. The estimated rates of return are shown below.

**STATE OF THE PROBABILITY RATE OF RETURN**

**ECONOMY OF OCCURRENCE A B C**

Recession 0.25 10% 9% 14%

Average 0.50 14 13 12

BOOM 0.25 16 18 10

**Required**

1. Find each project expected rate of return, variance, standard deviation and coefficient of variation **[6 Marks]**
2. Compute the correlation coefficient between
   1. A and B
   2. A and C
   3. B and C **[6 Marks]**
3. Compute the expected return on a portfolio if the firm invests equal wealth on each asset. **[2 Marks]**
4. Compute the standard deviation of the portfolio. **[1 Mark]**

**QUESTION FOUR**

1. Explain briefly the assumptions of arbitrage pricing theory (APT)  **[4 Marks]**
2. Briefly describe six Limitations of the capital asset pricing model (CAPM) **[6 Marks]**
3. State the major assumptions of Maskowitz portfolio theory **[5 Marks]**

**QUESTION FIVE**

1. Describe five limitations of Black & Scholes Valuation Model  **[5 Marks]**
2. Describe three factors that affect the value of a call option **[3 Marks]**
3. The following data relates to call options on two shares A and B

A B

Month to expiration 3 9

Risk free rate 10% 10%

Standard deviation of stock 40% 40%

Exercise price sh55 sh55

Stock price sh 50 sh 50

**Required**

1. Calculate the price of call option  **[5 Marks]**
2. Of the two call options which would you expect to have a higher price and why **[2 Marks]**

**QUESTION SIX**

1. Consider two lotteries, A and B. The random payoff of lottery A, denoted by Ax~, is uniformly distributed on the interval [-3,5]. The random payoff of lottery B, denoted by Bx~, is uniformly distributed on the interval [0,6].
2. Draw graphically the densities (p.d.f.) and cumulative distribution function of these two lotteries. NB: we usually denote the density by f, and the c.d.f. by F. **[4 Marks]**
3. Using the graphs in question 1, show that lottery B dominates lottery A in a first-order stochastic dominance sense (explain briefly, notably by referring to the graphs and the definition of first-order stochastic dominance, no need for any calculation). **[3 Marks]**
4. First Order Stochastic Dominance (FOSD): Asset X dominates Asset Y in the sense of FOSD if and only if (denoted as iff) all individuals with increasing (non-decreasing) utility functions prefer X over Y. Now suppose Asset A stochastically dominates Asset B in the sense of FOSD and that Asset C stochastically dominates Asset D in the sense of FOSD. Let Asset U = A+C and let Asset V = B+D. Prove or disprove the claim that "U dominates V in the sense of FOSD" **[8 Marks]**