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THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE.

COURSE CODE: SAC 307

COURSE TITLE :FINANCIAL ECONOMICS

QUESTION 1 : C0MPULSORY and Any other two questions

a. Identify and explain any to factors that affect the riskness of securities [4 marks]

b.Define the following terms and show the relationship between them

i. First order stochastic dominance
ii. Second order stochastic dominance [6 marks]

c)Suppose the expected returns and variances of stocks A and B are $E(R_A) = 0.2$, $E(R_B) = 0.3, VAR(R_A) = 0.1$ and $VAR\ (R_B) = 0.2$, respectively

i. Calculate the expected return and variance of a portfolio that is composed of 60% A and 40% B, when the correlation coefficient between the stocks is -0.5. [4 marks]
ii. Calculate the expected return and variance of a portfolio that is composed of 60% A and 40% B when the correlation coefficient between the stocks is -0.6. [4 marks]
iii. How does the correlation coefficient affect the variance of the portfolio? [1 marks]

d)State atleast 3 shortcomings of CAPM [3 marks]

e) Suppose that Matheka plans to invest 200 percent of his wealth in the market portofolio.Current rate of treasury bills is 6% and expected market return and risk 14 and 20 % respectively. What would be the return and risk of Matheka's portfolio (3 marks)

f)State the major assumptions of the Markowitz Portfolio Theory (5 marks)

QUESTION 2

a)i)Define utility and state its units [2 marks]

ii)State and explain any two axioms of utility [2 marks]

b)An investor has current wealth 1 and uses the following utility function to make decisions

$$u(x) = x^{\frac{1}{2}}, x \geq 0$$

i)Determine the absolute risk aversion factor for this utility function as a function of wealth, w [2 marks]

ii)Determine the relative risk aversion factor for this utility function as a function of wealth, w [2 marks]

iii)The investor is considering investing all her wealth in one of two assets, A and B.The return on a unit invested in A has a uniform distribution on the interval [0.7,1.7].The return on unit invested in B will be either 0.7 or 1.7 with equal probability.Determine which of the two investments the investor will prefer.[7 marks]

iv)Calculate the 95% value at risk for the investment in A($z_{5\%} = 1.65$) [5 marks]

Question 3

(a) Consider the following table

Asset A	Asset B	Market
10	6	9
12	7	8
-4	3	11
5	-2	10
8	12	6

The risk free rate of return is 6 %

Calculate

(i)Sharpe measures for each of the assets and rank of the assets [6 marks]

(ii)Treynor measures for each of the assets and rank them [6 marks]

b) A given market risk of 20 % ,a correlation coefficient of 0.25 with stock Q.Q has a risk of 30 %. What is the beta of Q ? [2 marks]

c)State the assumptions of CAPM [6 marks]

Question 4

a)(i)Given the following returns on 2 portofolios, determine the arbitrage equilibrium factor pricing equation [3 marks]

Fund	E(r)	Beta
A	14	1.3
B	12	1.1

(ii)Assume that a portofolio C is to be purchased with the following characteristics

fund	E(r)	beta
C	14.2	1.15

Determine the proportions of A and B that would be put in a portofolio of C as well as the risk and return in portofolio C. [3 marks]

iii.What will be the arbitrage opportunities if portofolio C is purchased. [2 marks]

b)Suppose a to factor model describes the following return:

$$E(r_i) = a_0 + a_1 b_1 + a_2 b_2$$

With the following characteristics

Portotfolio	E(r)	b_1	b_2
D	17%	1	0.8
G	15%	0.7	1
K	12%	0.6	0.5

i)Determine the 2 factor equilibrium for the 3 portofolios [4 marks]

Suppose stock L is in disequilibrium with the following distribution

Stock	E(r)	b_1	b_2
L	16%	0.8	0.7

ii)Demonstrate how one would make riskless profit by selecting a portofolio in L [6 marks]

c)Explain the weak form effiency of the market hypothesis [2 marks]

QUESTION 5

a)Assume an analysis has been following the performance of certain stocks and has come up with the following information

stock	Current price (P_t)	Expected price(P_{t+1})	Dividend (D_{t+1})
A	25	27	0.5
B	40	42	0.5
C	33	39	1.0
D	64	65	1.1
E	50	54	-

Take the risk free rate of return, R_f =6 %

Return of market =12%

i)Calculate the estimated returns for each security [5 marks]

ii)Using SML calculate the required (expected) rates of return and summarize this in a table.The values of beta are indicated in the table below [6marks]

Stock	Beta
A	0.70
B	1.00
C	1.15
D	1.40
E	-0.30

iii)Also calculate the Jensen's Alpha of each stock and indicate how each stock is perfomed. [6 marks]

iv)Show a plot of the estimated returns on the SML graph [3 marks]