Problem Set #7 Solutions

1. An investor can design a risky portfolio based on two stocks, A and B. The standard deviation of return on stock A is 20% while the standard deviation on stock B is 15%. The expected return on stock A is 20% while on stock B it is 10%. The correlation coefficient between the return on A and B is 0%. The expected return on the minimum variance portfolio is approximately __________.

   A. 10.00%
   B. 13.60%
   C. 15.00%
   D. 19.41%

$$w_A = \frac{.15^2 - 0(.2)(.15)}{.15^2 + .2^2 - 2(0)(.2)(.15} = .36$$

$w_B = 1 - .36 = .64$

$E(r_P) = (.36)(.20) + (.64)(.10) = .136$

2. The expected rate of return of a portfolio of risky securities is __________.

   A. the sum of the securities' covariances
   B. the sum of the securities' variances
   C. the weighted sum of the securities' expected returns
   D. the weighted sum of the securities' variances

3. Asset A has an expected return of 15% and a reward-to-variability ratio of .4. Asset B has an expected return of 20% and a reward-to-variability ratio of .3. A risk-averse investor would prefer a portfolio using the risk-free asset and ______.

   A. asset A
   B. asset B
   C. no risky asset
   D. can't tell from the data given

4. Risk that can be eliminated through diversification is called ______ risk.

   A. unique
   B. firm-specific
   C. diversifiable
   D. all of the above

5. A portfolio with a 25% standard deviation generated a return of 15% last year when T-bills were paying 4.5%. This portfolio had a Sharpe measure of _____.

A. 0.22
B. 0.60
C. 0.42
D. 0.25

$$S_p = \frac{.15 - .045}{.025} = 0.42$$

6. A portfolio is composed of two stocks, A and B. Stock A has a standard deviation of return of 24% while stock B has a standard deviation of return of 18%. Stock A comprises 60% of the portfolio while stock B comprises 40% of the portfolio. If the variance of return on the portfolio is .0380, the correlation coefficient between the returns on A and B is __________.

A. 0.583
B. 0.225
C. 0.327
D. 0.128

$.0380 = (.6)^2(.24)^2 + (.4)^2(.18)^2 + 2(.6)(.4)(.24)(.18)(\rho_{A,B})$

$.0380 - .020736 - 0.005184 = 0.020736 (\rho_{A,B})$

$\rho_{A,B} = 0.582562$