Student ID: ……

Question 1 (25 Points)

Tony has a portfolio investment consisting of stock A and B. Now, he is considering to include stock C into his portfolio. Given the information below, please help Tony decide whether he should include stock C into his current portfolio by answering the following questions.

State of Economy	Probability	Rate of Return if State Occurs		
		Stock A	Stock B	Stock C
Boom	0.20	30.00	45.00	33.00
Good	0.40	12.00	10.00	15.00
Poor	0.30	1.00	-15.00	-5.00
Bust	0.10	-6.00	-3.00	-9.00
Expected Return		10.50	8.20	10.20
Variance		131.25	446.16	219.36
Standard Deviation		11.46	21.12	14.81

1.1 Tony's portfolio is invested 30% in stock A and 70% in stock B. Suppose that correlation coefficient of stock A and B returns is equal 0.65, what are the expected return of the portfolio and risk as measured by variance and standard deviation? **(10 points)**

1.2 In case Tony includes stock C, his new portfolio would have 40% weighting on new stock and the other 60% is allocated for the combination of old stocks. Given the correlation between current portfolio return and stock C is 0.75, what are Tony's new expected return, variance, and standard deviation of new portfolio? **(10 points)**

1.3 Using appropriate criteria, decide if stock C should be invested? Why? **(5 points)**

Student ID: ……

Question 2 (30 Points)

Winnie has a portfolio investment with expected portfolio return at 9% and variance at 110 or 10.4881 standard deviation. Now, he is considering to include ONE stock into his current portfolio. He contracted two investment companies and got the following suggestions – Company A introduced stock X for Winnie, and Company B convinced him to invest in stock Y. Winnie formed below table presenting return and variance of stock X and Y to make his own analysis:

	Company A: Stock X	**Company B: Stock Y**
Expected Return	12%	18%
Variance	145	175
Standard Deviation	12.0416	13.2288

Correlation between Winnie's current portfolio return and stock X is 0.75, while the correlation with stock Y is 0.90.

Due to Winnie's plan to invest in only one stock, he intends to allocate 40% for new stock investment and the other 60% for the combination of old stocks. As a financial planner, please help Winnie to obtain appropriate investment strategy.

2.1 Calculate expected return and measure risk (i.e. from variance and standard deviation) that associated with the new portfolio if Winnie decides to pick **stock X** into his current portfolio. **(10 points)**

2.2 Calculate expected return and measure risk (i.e. from variance and standard deviation) that associated with the new portfolio if Winnie decides to pick **stock Y** into his current portfolio. **(10 points)**

2.3 With the findings from **(2.1)** and **(2.2)**, which stock would you recommend Winnie to include into current portfolio? Why? (Note that only one stock will be selected). **(10 points)**