Quiz 3: Equity Instruments

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. You have been asked to review the valuation of Diplas Inc., a privately owned chemical firm. The firm reported earnings before interest and taxes of $10 million in the most recent year and it was valued by an analyst at $70 million using the average enterprise value to sales ratio of 1.00 at which publicly traded chemical firms trade, and after applying an illiquidity discount of 30%. You believe that the valuation is incorrect on two counts:

   - The average pre-tax operating margin of the publicly traded chemical firms is only 5%, and a regression of value to sales ratios against pre-tax operating margins for firms in this sector yields the following:
     \[ \text{Value to Sales} = 0.60 + 8.00 \times (\text{Pre-tax operating margin}) \]

   - You feel that the illiquidity discount should be smaller to reflect the firm’s size. You use the bid-ask spread regression to estimate the discount:
     \[ \text{Bid-Ask Spread} = 0.30 - 0.04 \times (\ln(\text{Revenues})) \]

   If Diplas has negligible holdings of cash and marketable securities, estimate the correct value of Diplas Inc. (3 points)
2. You have a 30-year lease on a run-down building in New York City that you would like to develop into rental properties. The cost of the conversion today is $15 million – you could borrow $10 million from the bank at 7% and use your equity for the balance - and you estimate the rental revenues each year, if you convert today, will be $1 million a year (before taxes) for the remaining life of the lease. The rental market in New York is a volatile one, though, and the annualized standard deviation in the rental revenues is 25%. The 30-year treasury bond rate is 5%, the market risk premium is 4% and the unlevered beta of real estate companies is 0.60. (The tax rate is 40%.)

   a. Estimate the net present value of conversion today.  (3 points)
b. Estimate the value of the lease as an option. (2 points for inputs; 2 points for value)

\[ S = \]
\[ K = \]
\[ t = \]

Standard deviation =
Riskless rate =
Cost of delay (dividend yield) =