**BLACK-SCHOLES CALL PRICE PROBLEM**

Yara Inc is listed on the NYSE with a stock price of $40 the company is not known to pay dividends. We need to price a call option with a strike of $45 maturing in 4 months. The continuously-compounded risk-free rate is 3%/year, the mean return on the stock is 7%/year, and the standard deviation of the stock return is 40%/year. What is the Black Scholes call price?

The Black Scholes call price can be computed using the model defined in terms of maturity time and the current price of the stock as follows

Where and are the normal distribution function for and respectively, and

T = time to mature in years = 4/12 =1/3 years

S = current price of underlying stock = $40

K = strike price agreed upon price of operation execution = $45

R = risk free rate = 3%/year

= price volatility (standard deviation) = 40%/year

Substituting these values to compute and gives

The standard normal distribution probability is then computed for these two values by reading a standard normal distribution table and since they majorly support 2 decimal places, the values would be rounded to 2 decimal places thus

Looking up the values on a standard normal distribution table gives

Substituting into the expression for the call price and computing further gives

Thus, the Black-Scholes call price is then