**Assignment 4 – Derivative Securities**

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The assignment is to be done individually. Show your work thoroughly and post your MATLAB code to t-square. Unless, it will be assumed that you did not solve it.

1. The stock follows the GBM as where μ=0.05, σ=0.25. And, the risk free rate is 3% (annualized continuously compounded yield). You are the CEO of a company. You know that after 2 years, the company will compensates you with the squared price of the stock value of S\_2. The stock price today, S\_0, is $1,000.
   1. What is the price of your compensation?

**1.2142\*106**

* 1. What is the delta of your compensation?

**where**

\*

**Delta at t=0 is 2407.3**

* 1. What is the gamma of your compensation?

**where**

**Gamma at t = 0 is 2.4067**

1. You are worried about the risk of your compensation described as above. With the underlying stock and the two options the underlying asset of which is the stock of the company - Call with K=1200, T=1 and Put with K=1600, T=3, construct a dynamic hedging strategy over t=0 and t=0.5 such that i) zero-investment at the beginning and ii) if you hold the portfolio in addition to your compensation plan, you can erase the delta and gamma risk of your aggregate portfolio - including the compensation plan. Plot one sample path of your aggregate portfolio over t=0 and t=0.5.

