University of Texas at Austin

Quiz # 12

Black-Scholes pricing.

Provide your **complete solution** to the following problems. Final answers only, without appropriate justification, will receive zero points even if correct.

Problem 12.1. The current price of a continuous-dividend paying stock is observed to be \$50 per share while its volatility is given to be 0.34. The dividend yield is projected to be 0.02.

The continuously compounded, risk-free interest rate is 0.05.

Consider a European call option with the strike price equal to \$40 and the exercise date in three months.

Using the Black-Scholes pricing formula, find the value $V_C(0)$ of this option at time-0.

(a) \$9.08

(b) \$9.80

(c) \$10.55

(d) \$14.10

(e) None of the above.

Problem 12.2. (5 points) Consider a continuous-dividend-paying stock whose current price equals \$100 per share. The stock's dividend yield equals 0.01 while its volatility equals 0.25.

The continuously compounded risk-free interest rate is given to be 0.05.

Using the Black-Scholes model, calculate the price of a \$98-strike, three-month European put option on the above stock.

(a) \$3.37

(b) \$3.80

(c) \$4.55

(d) \$5.10

(e) None of the above.

Problem 12.3. (5 points) The current price of a continuous-dividend-paying stock is given to be \$92. The stock's volatility is 0.35 and its dividend yield is 0.02.

The continuously compounded risk-free interest rate is 0.05.

Consider a \$90-strike European call option on the above stock with exercise date in a quarter-year.

What is the Black-Scholes price of this call option?

(a) 5.05

(b) 7.66

(c) 7.71

(d) 7.89

(e) None of the above.