EC3333 Tutorial 10

1. The current price of the ABC Corporation stock is $6. In each of the next two years, this stock price can either go up by $2.50 or go down by $2. The stock pays no dividends. The one-year risk-free interest rate is 3% and will remain constant. Use the Binomial Option Pricing Model to find the replicating portfolio and the value of a two-year

    a. European call option on the ABC stock with a strike price of $7.

    b. European put option on the ABC stock with a strike price of $7.

2. Use the Black-Scholes Option Pricing Model and the table below for this question.

    a. What is the value of a European call option on a stock with the following characteristics?

Time to expiration	6 months
Standard deviation	50% per year
Exercise price	$50
Stock price	$50
Annual Interest Rate	3%
Dividend	0

    b. What is the value of a European put option on the same stock with the same exerciseprice and time to expiration?

    c. Recalculate the value of the European call option, successively substituting one of the changes below while keeping the values of the other parameters stated above. Consider each scenario independently.

        i. Time to expiration = 3 months.

        ii. Standard deviation = 25% per year.

        iii. Exercise price = $55.

        iv. Stock price = $55.

        v. Interest rate = 5%.

3. Using the information in Problem 1, calculate the risk-neutral probabilities. Then use them to price the value of a two-year European call option on the ABC stock with a strike price of $7.

4. Explain why risk-neutral probabilities can be used to price derivative securities in a world where investors are risk averse.