**Question 1**

Consider an option on a non-dividend-paying stock when the stock price is $30, the exercise price is $29, the risk-free interest rate is 5% per annum, the volatility is 25% per annum, and the time to maturity is four months.

1. What is the price of the option if it is a European call?
2. What is the price of the option if it is an American call?
3. What is the price of the option if it is a European put?
4. Verify that put–call parity holds.

**Question 2**

Assume that the stock in Question 1is due to go ex-dividend in 1.5 months. The expected dividend is 50 cents.

1. What is the price of the option if it is a European call?
2. What is the price of the option if it is a European put?
3. Use the results in the Appendix to this chapter to determine whether there are any circumstances under which the option is exercised early.

**Question 3**

What is the price of a European put option on a non-dividend-paying stock when the stock price is $69, the strike price is $70, the risk-free interest rate is 5% per annum, the volatility is 35% per annum, and the time to maturity is six months?

**Question 4**

A foreign currency is currently worth $1.50. The domestic and foreign risk-free interest rates are 5% and 9%, respectively. Calculate a lower bound for the value of a six-month call option on the currency with a strike price of $1.40 if it is (a) European and (b) American.

**Question 5**

Consider a stock index currently standing at 250. The dividend yield on the index is 4% per annum, and the risk-free rate is 6% per annum. A three-month European call option on the index with a strike price of 245 is currently worth $10. What is the value of a three-month put option on the index with a strike price of 245?

**Question 6**

An index currently stands at 696 and has a volatility of 30% per annum. The risk-free rate of interest is 7% per annum and the index provides a dividend yield of 4% per annum. Calculate the value of a three-month European put with an exercise price of 700.