Problem 4.1. Jafee Corp. common stock is priced at $36.50 per share. The company just paid its $0.50 quarterly dividend. Interest rates are 6.0%. A $35.00 strike European call, maturing in 6 months, sells for $3.20. What is the price $V_P(0)$ of a 6-month, $35.00 strike put option?

(a) $0 \leq V_P(0) < 1.25$

(b) $1.25 \leq V_P(0) < 1.45$

(c) $1.45 \leq V_P(0) < 1.55$

(d) $1.55 \leq V_P(0) < 1.66$

(e) $1.66 \leq V_P(0)$

Problem 4.2. Assume that a stock pays no dividends. Its initial price is given to be $2. Consider two European-style derivative securities on the above stock, both with the exercise date in one year. They have the following payoffs:

I: $V_I(T) = (5S(T) - 10)_+$

II: $V_{II}(T) = (10 - 5S(T))_+$

with $T = 1$. It is observed that the price of derivative $I$ at time $0$ equals $V_I(0) = 2$.

Given that the continuously compounded risk-free interest rate equals 0.05, what is the no-arbitrage time $0$ price of derivative $II$?

Problem 4.3. The price today of a common stock is $100 per share. You are given that:

1. Dividends in equal amounts are to be paid in exactly 2 months and then again in 4 months.
2. A European call on the above stock with strike $K = 100$ and the exercise date in six months sells for $7.42$.
3. A European put on the above stock with strike $K = 100$ and the exercise date in six months sells for $8.90$.
4. The continuously-compounded risk-free interest rate equals 0.05.

Calculate the amount of each dividend.

(a) About 5

(b) About 4

(c) About 3

(d) About 2

(e) None of the above

Problem 4.4. A certain common stock is priced at $36.50 per share. The company just paid its $0.50 quarterly dividend. Assume that the interest rate is $r = 6.0\%$. Consider a $35$ strike European call, maturing in 6 months which currently sells for $3.20. What is the price of the corresponding 6-month, $35$ strike put option?

(a) $1.20$

(b) $1.69$

(c) $2.04$

(d) $2.38$

(e) None of the above

Problem 4.5. Solve Sample MFE Problem #25.
Problem 4.6. The initial price of a chooser option is greater than or equal to the price of a regular European call on the same asset with the same strike and exercise date. True or false?

Problem 4.7. Consider a chooser option on a stock $S$ whose current price is $100$ per share. Assume that we are using our usual notation, i.e., let

$$V_{CH}(0, t^*, T, K)$$

denote the time−0 price of a chooser option with choice date $t^*$, exercise date $T$ and strike price $K$. Then, the following inequality holds:

(a) $V_{CH}(0, t^*, T, K) \leq V_P(0, T, K)$
(b) $V_{CH}(0, t^*, T, K) \leq V_C(0, T, K)$
(c) $\max(V_P(0, T, K), V_C(0, T, K)) \leq V_{CH}(0, t^*, T, K)$
(d) $V_{CH}(0, t^*, T, K) < \max(V_P(0, T, K), V_C(0, T, K))$
(e) None of the above