Problem Set Questions

I. Options:
   A. BKM, Chapter 20, Question 4.
   B. BKM, Chapter 20, Question 5.
   C. BKM, Chapter 20, Question 9, parts a, b, c and e.

II. Futures and Forward Contracts:
   A. BKM, Chapter 22, Question 6.
   B. It is now January. The current interest rate is 8% EAR. The June futures price for gold is $346.30, whereas the December futures price is $360. Is there an arbitrage opportunity here? If so, how would you exploit it?
   C. The S&P portfolio pays a dividend of 2% annually. Its current value is 1020. The T-bill rate is 5% EAR. Suppose the S&P futures price for delivery in one year is 1060. Construct an arbitrage opportunity. Assume the dividend of 2% is paid in one year hence.
   D. BKM, Chapter 23, Question 5. For part c, assume that your portfolio consists of 60% in equities and 40% in T-bills.
   E. The following formula converts discount bond discount factors to forward contract discount factors (it was introduced earlier in Lecture Note 7):

\[ d_{t+\tau}(0) = \frac{d_{t+\tau}(0)}{d(t)} \]

Is this formula consistent with the spot futures parity theorem? Explain why or why not. (Hint. Think about \(d_{t+\tau}(0)\) as referring to the forward price at time 0 for delivery of a \(\tau\)-discount bond at time \(t\).)

F. BKM, Chapter 23, Question 8.