Solution to (1)  

Answer: (A)

The put-call parity formula (for a European call and a European put on a stock with the same strike price and maturity date) is

\[
C - P = F_{0,T}^P(S) - F_{0,T}^P(K)
\]

\[
= F_{0,T}^P(S) - PV_{0,T}(K)
\]

\[
= F_{0,T}^P(S) - Ke^{-rT}
\]

\[
= S_0 - Ke^{-rT},
\]

because the stock pays no dividends

We are given that \( C - P = 0.15, S_0 = 60, K = 70 \) and \( T = 4 \). Then, \( r = 0.039 \).

Remark 1: If the stock pays \( n \) dividends of fixed amounts \( D_1, D_2, \ldots, D_n \) at fixed times \( t_1, t_2, \ldots, t_n \) prior to the option maturity date, \( T \), then the put-call parity formula for European put and call options is

\[
C - P = F_{0,T}^P(S) - Ke^{-rT}
\]

\[
= S_0 - PV_{0,T}(\text{Div}) - Ke^{-rT},
\]

where \( PV_{0,T}(\text{Div}) = \sum_{i=1}^{n} D_i e^{-r t_i} \) is the present value of all dividends up to time \( T \). The difference, \( S_0 - PV_{0,T}(\text{Div}) \), is the prepaid forward price \( F_{0,T}^P(S) \).

Remark 2: The put-call parity formula above does not hold for American put and call options. For the American case, the parity relationship becomes

\[
S_0 - PV_{0,T}(\text{Div}) - K \leq C - P \leq S_0 - Ke^{-rT}.
\]

This result is given in Appendix 9A of McDonald (2006) but is not required for Exam MFE/3F. Nevertheless, you may want to try proving the inequalities as follows:
For the first inequality, consider a portfolio consisting of a European call plus an amount of cash equal to \( PV_{0,T}(\text{Div}) + K \).
For the second inequality, consider a portfolio of an American put option plus one share of the stock.