

12. You are given:

- (i) $C(K, T)$ denotes the current price of a K -strike T -year European call option on a nondividend-paying stock.
- (ii) $P(K, T)$ denotes the current price of a K -strike T -year European put option on the same stock.
- (iii) S denotes the current price of the stock.
- (iv) The continuously compounded risk-free interest rate is r .

Which of the following is (are) correct?

- (I) $0 \leq C(50, T) - C(55, T) \leq 5e^{-rT}$
 - (II) $50e^{-rT} \leq P(45, T) - C(50, T) + S \leq 55e^{-rT}$
 - (III) $45e^{-rT} \leq P(45, T) - C(50, T) + S \leq 50e^{-rT}$
- (A) (I) only
 - (B) (II) only
 - (C) (III) only
 - (D) (I) and (II) only
 - (E) (I) and (III) only