6. Consider a model with two stocks. Each stock pays dividends continuously at a rate proportional to its price.

$S_j(t)$ denotes the price of one share of stock j at time t.

Consider a claim maturing at time 3. The payoff of the claim is

$$\text{Maximum } \left(S_1(3), S_2(3)\right).$$

You are given:

(i) $S_1(0) = \$100$

(ii) $S_2(0) = \$200$

(iii) Stock 1 pays dividends of amount $(0.05)S_1(t)dt$ between time t and time $t + dt$.

(iv) Stock 2 pays dividends of amount $(0.1)S_2(t)dt$ between time t and time $t + dt$.

(v) The price of a European option to exchange Stock 2 for Stock 1 at time 3 is \$10.

Calculate the price of the claim.

(A) \$96

(B) \$145

(C) \$158

(D) \$200

(E) \$234