Solution to (6) Answer: (C)

$$C(S,K,\sigma,r,T,\delta) = Se^{-\delta T}N(d_1) - Ke^{-rT}N(d_2) \qquad (12.1)$$

with

$$d_1 = \frac{\ln(S/K) + (r - \delta + \frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}} \qquad (12.2a)$$

$$d_2 = d_1 - \sigma\sqrt{T} \qquad (12.2b)$$

Because S = 20, K = 25, σ = 0.24, r = 0.05, T = 3/12 = 0.25, and δ = 0.03, we have

$$d_1 = \frac{\ln(20/25) + (0.05 - 0.03 + \frac{1}{2}0.24^2)0.25}{0.24\sqrt{0.25}} = -1.75786$$

and

$$d_2 = -1.75786 - 0.24\sqrt{0.25} = -1.87786$$

Using the Cumulative Normal Distribution Calculator, we obtain $N(-1.75786)$ = 0.03939 and $N(-1.87786)$ = 0.03020.

Hence, formula (12.1) becomes

$$C = 20e^{-(0.03)(0.25)}(0.03939) - 25e^{-(0.05)(0.25)}(0.03020) = 0.036292362$$

Cost of the block of 100 options = 100 × 0.0363 = \$3.63.