122. Solution: D

The marginal distribution of Y is given by $f_2(y) = \int_0^y 6\, e^{-x}\, e^{-2y}\, dx = 6\, e^{-2y} \int_0^y e^{-x}\, dx$

$= -6\, e^{-2y}\, e^{-y} + 6e^{-2y} = 6\, e^{-2y} - 6\, e^{-3y},\ 0 < y < \infty$

Therefore, $E(Y) = \int_0^\infty y\ f_2(y)\, dy = \int_0^\infty (6ye^{-2y} - 6ye^{-3y})\, dy = 6 \int_0^\infty ye^{-2y}\, dy - 6 \int_0^\infty y\ e^{-3y}\, dy =$

$\frac{6}{2}\int_0^\infty 2\ ye^{-2y}\, dy - \frac{6}{3}\int_0^\infty 3\, y\, e^{-3y}\, dy$

But $\int_0^\infty 2\, y\, e^{-2y}\, dy$ and $\int_0^\infty 3\, y\, e^{-3y}\, dy$ are equivalent to the means of exponential random variables with parameters 1/2 and 1/3, respectively. In other words, $\int_0^\infty 2\, y\, e^{-2y}\, dy = 1/2$ and $\int_0^\infty 3\, y\, e^{-3y}\, dy = 1/3$. We conclude that E(Y) = (6/2) (1/2) – (6/3) (1/3) = 3/2 – 2/3 = 9/6 – 4/6 = 5/6 = 0.83 .