

121. Solution: C

The marginal density of X is given by

$$f_x(x) = \int_0^1 \frac{1}{64} (10 - xy^2) dy = \frac{1}{64} \left(10y - \frac{xy^3}{3} \right) \Big|_0^1 = \frac{1}{64} \left(10 - \frac{x}{3} \right)$$

$$\text{Then } E(X) = \int_2^{10} x f_x(x) dx = \int_2^{10} \frac{1}{64} \left(10x - \frac{x^2}{3} \right) dx = \frac{1}{64} \left(5x^2 - \frac{x^3}{9} \right) \Big|_2^{10}$$

$$= \frac{1}{64} \left[\left(500 - \frac{1000}{9} \right) - \left(20 - \frac{8}{9} \right) \right] = 5.778$$