135. Key: E

\[ \text{Var} (N) = \text{E} \left[ \text{Var} (N | \lambda) \right] + \text{Var} \left[ \text{E} (N | \lambda) \right] = \text{E} (\lambda) + \text{Var} (\lambda) = 1.50 + 0.75 = 2.25 \]

136. Key: D

\( X \) follows a geometric distribution with \( p = \frac{1}{6} \). \( Y = 2 \) implies the first roll is not a 6 and the second roll is a 6. This means a 5 is obtained for the first time on the first roll (probability = 20%) or a 5 is obtained for the first time on the third or later roll (probability = 80%).

\[ E[X | X \geq 3] = \frac{1}{p} + 2 = 6 + 2 = 8, \text{ so } E[X|Y = 2] = 0.2(1) + 0.8(8) = 6.6 \]

137. Key: E

Because \( X \) and \( Y \) are independent and identically distributed, the moment generating function of \( X + Y \) equals \( K^2(t) \), where \( K(t) \) is the moment generating function common to \( X \) and \( Y \). Thus, \( K(t) = 0.30e^{-t} + 0.40 + 0.30e^t \). This is the moment generating function of a discrete random variable that assumes the values -1, 0, and 1 with respective probabilities 0.30, 0.40, and 0.30. The value we seek is thus 0.70.