

I 1~5 CCBDC

II 1~10 $\frac{21}{43}, \frac{5}{28}, \frac{1}{2}, e^{-1}, 0.7-0.4e^{-1}$

$\frac{1}{2}e^{-2(1-10)}, 3, 6, 0.9, \frac{5}{7}$

III (1) $P(X_1) = \frac{10}{63}$

(2) $P(X_3) = \frac{1}{3} \quad P(X_2 \cap X_3) = \frac{1}{12} \quad P(X_2|X_3) = \frac{1}{4}$

(3) $P(X_4) = \frac{2}{7}$

2, G为事件E,F都不发生. $\mathcal{A} = \{E, F, GE, GF, GGE, \dots\}$

$P(X) = \frac{P_1}{P_1 + P_2}$

3, (1) 略 (2)

(3) $P(Z)$

$$P_X \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \frac{7}{15} & \frac{7}{15} & \frac{1}{15} \\ \hline \end{array}$$

$$P_Y \begin{array}{|c|c|c|} \hline 0 & 1 & 2 \\ \hline \frac{1}{3} & \frac{8}{15} & \frac{2}{15} \\ \hline \end{array}$$

4, (1) $f_Y(y) = \frac{1}{\sqrt{2\pi}y} e^{-\frac{\ln y}{2}}$ $0 < y < 1$ $y > 0$

(2) $f_Y(y) = \frac{e^{-\frac{1}{2}}}{\sqrt{2\pi}(1-y)}$

5 (1) $P(X, y) = \frac{\lambda_1^x \cdot \lambda_2^y}{x! y!} e^{-(\lambda_1 + \lambda_2)}$ $x, y \in \mathbb{N}$

(2) $P(X+Y=n) \quad P(X=k|X+Y=n) = \binom{n}{k} \left(\frac{\lambda_1}{\lambda_1 + \lambda_2}\right)^k \left(\frac{\lambda_2}{\lambda_1 + \lambda_2}\right)^{n-k}$

6, (1) $f(x, y) = \begin{cases} 6e^{-2x-3y} & x, y > 0 \\ 0 & \text{else} \end{cases}$

(2) $f_X(x) = 2 \cdot e^{-2x} \quad x > 0, \quad f_Y(y) = 3e^{-3y} \quad y > 0$

$f(x, y) = f_X(x) f_Y(y)$ 独立

(3) $P(1 < X < 3, 1 < Y < 2) = (e^{-2} - e^{-6})(e^{-3} - e^{-6})$