第四周

叶畅飞　3240103132

B2

(1)

X	0	1	2	4
P	0.8	0.16	0.032	0.008

(2) $P\{X>2\}=P\{X=4\}=0.008$

(3) $P\{X=4\mid X\geq 2\}=\dfrac{P\{X=4\}}{P\{X=2\}+P\{X=4\}}=\dfrac{0.008}{0.04}=\dfrac{1}{5}$

B7

$P\{X=0\}=(1-p_1)(1-p_2)(1-p_3)$

$P\{X=1\}=p_1(1-p_2)(1-p_3)+(1-p_1)p_2(1-p_3)+(1-p_1)(1-p_2)p_3$

$P\{X=2\}=(1-p_1)p_2p_3+p_1(1-p_2)p_3+p_1p_2(1-p_3)$

$P\{X=3\}=p_1p_2p_3$

$P\{Y=0\}=p_1$

$P\{Y=1\}=(1-p_1)p_2$

$P\{Y=2\}=(1-p_1)(1-p_2)p_3$

$P\{Y=3\}=(1-p_1)(1-p_2)(1-p_3)$

B8

(1)

X	1	2	3	4	5
P	p	$(1-p)p$	$(1-p)^2p$	$(1-p)^3p$	$(1-p)^4$

(2)

$P\{X\leq 2.5\}=P\{X=1\}+P\{X=2\}=p(2-p)$

B9

(1)

$$P\{X\geq 2\}=1-P\{X=0\}-P\{X=1\}=1-\frac{e^{-1}(1)^0}{0!}-\frac{e^{-1}(1)^1}{1!}=1-e^{-1}-e^{-1}=1-2e^{-1}$$

(2)

$$P\{X\leq 3\mid P\geq 2\}=\frac{P\{X=2\}+P\{X=3\}}{P\{X\geq 2\}}=\frac{\frac{e^{-1}(1)^2}{2!}+\frac{e^{-1}(1)^3}{3!}}{1-2e^{-1}}=\frac{2}{3e-6}$$

B11

(1)

已知$P\{X\geq 1\}=1-\dfrac{e^{-\lambda}\lambda^0}{0!}=1-e^{-4.5}\Rightarrow\lambda=4.5$

则$P\{X\geq 2\}=1-P\{X=0\}-P\{X=1\}=1-\dfrac{e^{-4.5}(4.5)^0}{0!}-\dfrac{e^{-4.5}(4.5)^1}{1!}=1-5.5e^{-4.5}$

(2)

$$P\{X=1\mid X\geq 1\}=\frac{P\{X=1\}}{P\{X\geq 1\}}=\frac{\dfrac{e^{-3.2}(3.2)^1}{1!}}{1-\dfrac{e^{-3.2}(3.2)^0}{0!}}=\frac{3.2}{e^{3.2}-1}$$

B12

(1) $P\{X=6\}=\dfrac{e^{-6}(6)^6}{6!}=\dfrac{324}{5e^6}$

(2)

$$P\{X=6\mid X\geq 5\}=\frac{P\{X=6\}}{P\{X\geq 5\}}=\frac{\dfrac{324}{5e^6}}{1-\displaystyle\sum_{i=0}^{4}\frac{e^{-6}(6)^i}{i!}}=\frac{324}{5e^6-575}$$

B14

(1) $P\{X=k\}=\dfrac{C_3^kC_7^{3-k}}{C_{10}^3},k=0,1,2,3$

(2) $P\{Y=k\}=C_3^k\left(\dfrac{1}{2}\right)^k\left(\dfrac{1}{2}\right)^{3-k}=\dfrac{C_3^k}{8},k=0,1,2,3$

(3) $P\{Z=k\}=\left(\dfrac{1}{10}\right)^k\left(\dfrac{9}{10}\right)^{k-1}=\dfrac{9^{k-1}}{10^k},k=0,1,2,3,\cdots$

(4) $P=\dfrac{1}{2}\times\dfrac{C_4^2}{2^4}=\dfrac{3}{16}$

B16

(1)

$$F(x)=\begin{cases}0, & x<0,\\ \dfrac{x}{2}, & 0\leq x<1,\\ \dfrac{1}{2}, & 1\leq x<2,\\ \dfrac{x-1}{2}, & 2\leq x<3,\\ 1, & x\geq 3,\end{cases}$$

(2)

$P\{X\leq 2.5\}=F(2.5)=\dfrac{3}{4}$