長庚大學期中、期末考試答案用紙

科目 統 計

108 學年度 第 2 學期 中考 資 工 系 姓名 孫維穎 學號 B072909

[1] (1) $f_X(x) = \begin{cases} x=0 \quad b(0,10,\frac{1}{10}) \doteq 0.3487 & x=3 \quad b(3,10,\frac{1}{10}) \doteq 0.0574 \\ x=1 \quad b(1,10,\frac{1}{10}) \doteq 0.3874 & x=4 \quad b(4,10,\frac{1}{10}) \doteq 0.0112 \\ x=2 \quad b(2,10,\frac{1}{10}) \doteq 0.1937 & x=5 \quad b(5,10,\frac{1}{10}) \doteq 0.0015 \\ 0, & x \in R \setminus S \end{cases}$ $x=6\sim10 \quad b \doteq 0$

(2) $E(X) = np = 1$ #

$k=10, n=10, p=0.1$

(3) $Var(X) = np(1-p) = 1 \cdot 0.9 = 0.9$

$Std(X) = \sqrt{Var(X)} = 0.9487$ #

(4)

(5)

(6)

令 $\lambda = \alpha t = n\alpha\Delta t = np$

$b(x;n,p) = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x}$

$= \frac{n(n-1)\cdots(n-x+1)}{x!} (\frac{\lambda}{n})^x (1-\frac{\lambda}{n})^{n-x}$

$\frac{n}{n} \cdot \frac{n-1}{n} \cdots \frac{n-x+1}{n} \cdot (1-\frac{\lambda}{n})^{-x}$

長庚大學期中、期末考試答案用紙

學年度 第 學期 考 系 姓名

[1] (4) $f_Y(x) = \begin{cases} \sum_{x=0}^{10} \frac{C_x^{10} \cdot C_{10-x}^{90}}{C_{10}^{100}}, & x\text{個紅球} \\ 0, & x \in R \setminus S \end{cases}$

(5) 同 (2)、(3) $\Rightarrow 1 + 0.9487 = 1.9487$ #

[2] (1) $f_W(w) = \begin{cases} \frac{e^{-100} \cdot (100)^w}{w!}, & \\ 0, & w \in R \setminus S \end{cases}$

(2)

約期

頻

λ 不变, $n \to \infty$

$(1-\frac{1}{n}) \cdots (1-\frac{x-1}{n}) \to 1$

$(1-\frac{\lambda}{n})^{-\frac{n}{\lambda}} \to e$

$(1-\frac{\lambda}{n})^{-x} \Rightarrow 1$

$\Rightarrow b(x;n,p) \Rightarrow \frac{\lambda^x e^{\lambda}}{x!} \Rightarrow p(x;M)$ #

[3] (1) $C_{10}^{100} \cdot (0.05)^{10} \cdot (0.95)^{90} = 0.0167$ #

(2) A bayer would saspect the claim isn't correct because assuming a correct claim,

occur only 1.67%

(請翻面繼續作答)

(5)

(6)

[4] 令 $\lambda = \alpha t = n\alpha\Delta t = np$

$b(x;n,p) = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x}$

$= \frac{n(n-1)\cdots(n-x+1)}{x!} (\frac{\lambda}{n})^x (1-\frac{\lambda}{n})^{n-x}$

$= 1 \cdot (\frac{1}{n})(1-\frac{2}{n}) \cdots (1-\frac{x-1}{n}) \frac{1}{x!} \lambda^x ((1-\frac{\lambda}{n})^{-\frac{n}{\lambda}})^{-\lambda} (1-\frac{\lambda}{n})^{-x}$

λ 不变, $n \to \infty$

$(1-\frac{1}{n}) \cdots (1-\frac{x-1}{n}) \to 1$

$(1-\frac{\lambda}{n})^{-\frac{n}{\lambda}} \to e$

$(1-\frac{\lambda}{n})^{-x} \Rightarrow 1$

$\Rightarrow b(x;n,p) \Rightarrow \frac{\lambda^x e^{\lambda}}{x!} \Rightarrow p(x;M)$ #

] (1) $C_{10}^{100} \cdot (0.05)^{10} \cdot (0.95)^{90} = 0.0167$ #