長庚大學期中、期末考試答案用紙

科目 _____

學年度 第 學期 考 系 姓名 羅元豪 學號 B0729038

1. (1) $\sum_{x=0}^{10} (x, 10, \frac{1}{10}) \cdot C_x^{10} (\frac{1}{10})^x (\frac{9}{10})^{10-x}$

$f_X(0) = 0.3487$ $f_X(5) = 0.0015$

$f_X(1) = 0.3874$ $f_X(6) = 0.0001$

$f_X(2) = 0.1937$ $f_X(7) = 8748\, e^{-0.6}$

$f_X(3) = 0.0574$ $f_X(8) = 3.645\, e^{-0.7}$

$f_X(4) = 0.0112$ $f_X(9) = 9\, e^{-09}$

$f_X(10) = 1\, e^{-10}$

(2) $n \cdot p \cdot \mu = 10 \cdot \frac{1}{10} = 1$

(3) $\sigma^2 = n \cdot p \cdot (1-p) = 10 \times \frac{1}{10} \times \frac{9}{10} = \frac{9}{10}$

$\sigma = \sqrt{\frac{9}{10}} \doteq 0.9487$

(4) $f_Y(k) = \frac{C_k^{10} \cdot C_{n-k}^{10}}{C_{10}^{100}}$

$f_Y(0) = 0.3305$ $f_Y(5) = 6.398\, e^{-04}$ $f_Y(10) = 5.7777 e^{-14}$

$f_Y(1) = 0.4080$ $f_Y(6) = 3.1\, e^{-05}$

$f_Y(2) = 0.2015$ $f_Y(7) = 8.144 e^{-06}$

$f_Y(3) = 0.0518$ $f_Y(8) = 1.0411 e^{-07}$

$f_Y(4) = 0.0076$ $f_Y(9) = 5.1992 e^{-11}$

(5) 期望值&標準差放不放回都不變

$E[Y] + std[Y] = 1 + 0.8487 \doteq 1.8487$

(6)

2. (1) $f(w) = P(100, 1) = \frac{e^{-1} \cdot 1^{100}}{100!} = 3.9419\, e^{-159}$

(2) $E[w] = \lambda t = 100 \times 1 = 100$

$\mu = \sigma^2 = 100$ $\sigma^2 = 100 \Rightarrow \sigma = \sqrt{100} = 10$

$E[w] + std[w] = 100 + 10 = 110$

(3) $\sum_{w=80}^{120} P(w, 100)$

(4) $P(w > 120) = 0.9819$

(5) 接受，因為平均100天會發生100場火災，然而每100天內發生的火災本來就有多有少，100天內有120場火災也是有可能的

(請翻面繼續作答)